PRE-HISTORIC INDIA

V. RANGACHARYA

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By

V. RANGACHARYA, M.A.

Anmol Publications
Delhi - 110051

Reprinted 1985

Published by
ANMOL PUBLICATIONS
20 New Lyalpur extension Delhi - 51

क्रमांक 5919
प्राप्ति —
State Museum Library, Lko.

Printed at Efficient Offset Printers,
Daya Basti Delhi

PREFACE

This book is the first in a series of nine volumes designed to carry the history of India from the earliest times to the Muhammadan conquest. This volume gives a succinct picture of the evolution of India and her races and cultures in the ages which preceded the Vedic Era. It thus provides the background in which the Vedic period of Indian History had its setting. The copious materials in the fields of ethnology, anthropology, geology, folklore and pre-historic antiquities, which have been made available in recent years, have been utilised in the preparation of this volume; and it is hoped that the attempt to correlate the results of the studies of these materials has been so successful as to leave in the mind of the reader a picture of what India was before the commencement of the Vedic age of her history.

The other volumes in the series which are about to be sent to the press are :—

Vol. 2. Vedic India.
Vol. 3. India from 650 B.C. to 320 B.C.
Vol. 4. The Mauryan Empire.
Vol. 5. India from the fall of the Mauryas to the rise of the Guptas.
Vol. 6. The Gupta Empire.
Vol. 7. North India from 600 to 1200 A.D.
Vol. 8. Dakkan from 600 to 1310 A.D.
Vol. 9. The Tamil States from 600 to 1310 A.D.

The present volume has had to be printed in a hurry and in the midst of heavy college work; and consequently, though The Huxley Press have done their work neatly and rapidly, a few typographical errors have crept in.

No arrangements have been made in this volume for the diacritical marks; but the coming volumes are free from this defect.

I have not included any maps as it is my object to publish a separate little Atlas of Indian History to illustrate the whole series, to be, in fact, a companion to them.

I am thankful to Mr. R. Rama Aiyar, M.A., Assistant Professor of History, Presidency College, for occasional help in reading the proofs and in preparing the index slips.

Madras, Octr. 1929 V. RANGACHARYA

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SUPPLEMENTARY NOTE TO CHAPTER VIII

In his elaborate work "The Ruling Races of Pre-historic Times' J. F. Hewitt traces the ethnology of the Dravidians and Aryans in the course of which he incidentally refers to the settlement of another non-Aryan people in the delta of the Indus. The views of Hewitt, though very inaccurate in the light of later researches, are interesting for the theory that there was a close connection between the Sumerians and some sections of the Indian population of later times. Lewis Rice summarises Hewitt's views in these sentences: The Dravidians were connected with Turvasu "the name of a star-worshipping people whose god (Akkadian *vasu*) was the meridian pole (*tur*), which stood for the Linga or the phallus, being evolved from the fire-drill and socket, its revolution amid the circumpolar stars of the Great Bear being considered the cause of the rains. They may be identified with the Zend Turanians (*an* signifying god in that language) and with the maritime traders called Tour-Sha and Tour-Sene or Tyrrheneans mentioned in Egyptian and Greek records. Their first great trading port was Dvaraka in the peninsula of Kathiawar; other exporting harbours being Surparaka (Surat) at the mouth of the Tapti, and Baragyza (Broach) at the mouth of the Narmada. They made settlements at the holy island of Dilmun (now Bahrein) in the Persian gulf, and at Eridu, near the mouth of the Euphrates.

"In course of time migration set the other way, and we meet with a race, also non-Aryan, who reverenced the moon *(sin)* and brought in the year of 13 lunar months. These were the Hus, Shus or Sus, the yellow race from the sources of the Tigris and Euphrates (and later of Shushorn) who settled in the delta of the Indus—the Suvarna from whom Sindh was called Sindhu-Suvarna, part of Bengal Karna-Suvarna, and Gujerat and Kathiawar received the name of Sau-rashtra. They correspond also with the Sabaroe of Ptolemy, the Suari of Pliny and the Sauviras of Baudhayana. They were the great Sumerian and Vaisya traders of Western Asia and India (if not China), the progenitors of the modern Saukars. Their capital was Patala (Haidarabad in Sindh), then a sea-port, though now 150 miles from the sea. They gave to the river its name Sindhu or Hindhu, which has come to designate the whole of India and its inhabitants. They are referred to as Yonas by Asoka and as Yavanas in the Mahabharata." (Rice's *Mys. Gazr.*, I, 109—110).

These views, it will be recognized, are very speculative and positively incorrect in some respects, but they are daring, original and suggestive. The derivation of *Sindhu* and *Hindu* from the immigrants from Mesopotamia is worth noting. The question will receive detailed attention in the second volume.

CHAPTER I

THE GEOGRAPHICAL EVOLUTION OF INDIA

From an examination of the structure of the different rocks of the earth geologists have traced its history, and consequently the history of life, from the Azoic times, when the earth was a simple burning mass with neither life nor organic forms, to the Tertiary age when man came into existence. This long period of earth-formation and life-development is usually divided into the different and successive stages of Azoic (lifeless); Palae-Ozoic (old-life); Mes-Ozoic (middle life) and Cen-Ozoic or Cain-Ozoic (recent life), also known as the Tertiary in contrast to the terms *primary* and *secondary* applied to the previous epochs. The physical features of India, its rocks, mountains, rivers. lakes and mineral deposits were also the results of the convulsions which occurred throughout these ages. Only, in the case of India, the four ages above-mentioned have been respectively, and rather unfortunately, styled Azoic (in its later stages, *purana*), the Dravidian, the early Aryan and the later Aryan. Each of these ages had a number of sub-ages, the cataclysms of which have left their traces on the animals, plant and mineral kingdoms of the world. There was, as has been already said, no life in the Azoic epoch. Life emerged in the Palae-Ozoic age, first in the form of invertebrates, then as fish and amphibia, and then as reptiles and birds. In the Mes-Ozoic and Cain-Ozoic ages, different types of Mammals were developed. Out of one type of these Mammals—the ape or a being like it—was developed, at the end of the Tertiary age, the noblest creation of God, namely, Man.

THE AZOIC EPOCH

The whole earth was an incandescent mass in this age.[1] There was therefore no separate geographical unit as India or any other country. In the latter part of it, however, there came into existence, as the result of the earth's cooling, a crust[2] of crystalline and banded rocks technically called Gneiss[3] and Schist, on which, in consequence of their igneous origin, there could have been no life. As a large part of the Peninsular and Himalayan India rests on such a substratum of gneiss and schist, it has been inferred that these parts of India must have been formed in the earliest period of geological history possible. The axis of the great Himalaya, the foundation on which its lofty heights and peaks lie, is formed of such 'granite' or associated crystalline rocks. The series extends right through to Ceylon. The continuity of the crystalline substratum from the Himalayan area to the extreme south of the Peninsula shows that the formation of a continuous Indian geological structure or backbone was as early as the formation of the earth's crust itself. The rock-support of India is, in other words, as old as 'creation.'

The formation of the type of rocks called after Dharwar in the Bombay Presidency, which are very familiar to the students of Indian geology, belonged to the later part of the Azoic age. The rocks of Dharwar in other words are next in age to the granite substratum of India. It has been ascertained from the folded character of these 'Dharwar rocks' that their formation was due to earth-movement and atmospheric action; that they too, like their predecessors were of igneous origin; and that their present distribution and structure were due to later volcanic action and subsequent alterations in structural and mineral compositions. From the distribution of these rocks it has been inferred that India was not yet a stable area during this period, that it was still in a flux. The Dharwar rocks are of incalculable economic value. They are chiefly found in the Central Provinces, Sandur, Bellary, Anantapur, Hyderabad and Mysore; and they contain a rich store of iron, manganese, copper and gold ores, which were formed by the solidified, molten matter during the formation of the cold outer crust.

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[1] The Nebular and the other theories of the origin of the earth, with which are associated the names of Kant, Laplace (1796), Lockyer (1890), Chamberlin, Moulton and others are, however fascinating, outside the province of history proper.

[2] According to one view this crust was at first fifty feet in thickness. It may be pointed out here that the earth, when it was formed out of the sun, was 5,500 miles in diameter. This increased to 8,100 miles in subsequent times, to eventually shrink to 7,918 miles. It was during this process that the lighter and harder materials like granite, basalt, etc., came to be formed into the continents, the bottoms of the seas, and so on.

[3] Gneiss is rock rolled into plate-like layers consisting of quartz, feldspar, etc. Schists also are foliated rocks presenting layers of different minerals. The granular crystalline type of quartz, feldspar, mica, etc., which is useful for building is called *granite*.

As regards the chronology of the Azoic epoch,[1] geologists differ widely from 800 millions to 20 million years ago. The subject is one of endless controversy and so the theme of an extensive speculative literature. Mr. Wells places it between 400 and 800 million years ago. The assignment of such vast ages reminds us of the elaborate chronology of the *Puranas*.[2]

THE PURANA EPOCH

The next age in the geological history of India has been styled the *Puranic*, literally ancient. It was in this period, it is believed, that India obtained the beginnings of its present geographical configuration. This is, it is believed, indicated by the distribution of a new kind of rock-deposits called after Cuddapah and the Vindhyas, extending from the lesser Himalaya across the Aravellis right down to the south. Bijapur, Gwalior, Karnul, the Kaimur Ranges, Rewah and other localities have furnished varieties of the group. These new rocks (of which sand-stones and mud-stones are the best examples) are, unlike the Azoic and Dharwar rocks, not igneous but sedimentary, that is, formed by the weathering of the high parts of the earth's crust by water and air. It has been suggested that, in the earlier periods of this age, the archæan rock backbone of India must have been covered by a sea from out of which the Peninsula-Himalayan stretch of land arose. To the north of the newly-formed 'lesser Himalaya' there was an extensive sea which covered China and the Pacific as far as North America and in the southern fringe of which was situated what is now called the Salt Range of the Punjab. This extensive Tibetan sea existed throughout the Palae-Ozoic, Mes-Ozoic and Tertiary times. It had a European counterpart in the west, but the European sea is believed not to have been connected with the Asiatic, to judge from the nature of the fossils embedded in them. The Puranic age was indeed an age of *pralayams* and upheavals!

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[1] Various methods have been adopted for the calculation of the age of the earth; for example, the time required for the accumulation of salt in the sea; the time required for the formation of sedimentary rocks which are in some areas 60 miles thick on account of the action of air and water; and so on. In the *Outline of Science*, edited by Prof. J. A. Thompson, the age allotted to the earth is 60 million years,—30 millions for the pre-Cambrian period, 18 to the Palae-Ozoic and 3 to the Cain-Ozoic. The theories of evolution and creation form the subject matter of the *Puranas* and afford fertile themes for study. One point in these theories is that matter was originally evolved from the mind.

[2] Not to be confounded with the *Purana* of sacred literature. Similarly *Aryan* and *Dravidian* in Geology have no ethnological significance.

THE PALAE-OZOIC EPOCH

It was in the course of the Palae-Ozoic age, which followed the Puranic, that we have the first indications of life on earth. The remains found in the fossils of the period indicate that the first animals of this earth of ours were of the simplest type possible, cansisting of minute, microscopic, rapidly-changing, single-celled creatures (called technically Protists or Radialoria). Similarly the plants were of the simplest type, called Algae.[1] The Palae-Ozoic sedimentary rocks have revealed a large number and variety of living things in the form of shell-fish, crabs, worms and similar crawling things. Then came fishes. For ages there existed only these swimming and creeping animals, the Trilobites as they have been called, and no other traces of life. Every thing that lived in these days lived under water. According to geological science, thus, water was the earliest breeding-place for animals, and it is from the water animals that, thanks to the principle of adaptation, even the land animals have become evolved. It is highly remarkable that the Indian puranic lore, which contains so much of unreliable matter, receives in this respect considerable support from the conclusions of science. The story of the creation of the world from out of water, the story of the *pralayams* and floods, of the *āvatars* of Vishnu as half-tortoise and half-fish,[1] seem to indicate, in a vague manner, a knowledge of the evolution of the world. It was only the other day that a famous scholar maintained before the British Association that Man can be gradually deduced from the shell-fish ! The knowledge may not be welcome to our vanity, but truth is very often unpleasant !

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[1] The term *algae* is now used for the common sea-weed. The earliest plants were of this type.

As the Palae-Ozoic age advanced, the development of life became, owing to climatic changes, more and more complex. Millions of new forms came into being. In the Cambrian, Silurian and Ordovician sub-periods, by which terms geologists indicate the earliest successive stages of Palae-Ozoic age, there were the invertebrate or backbone-less water animals like sponges, jelly-fish, worms, shells, tortoises, crustaceans and molluscs,[2] alone in existence. During the Devonian and Carboniferous sub-ages which followed, the water animals developed features which enabled them to encroach into. and live in, dry land also. The fish, for instance, was an animal developed in this manner, so that it could face a temporary stranding. Other aquatic animals showed equal adaptation. The class of creatures called amphibia, of which frogs ,afford a typical example, belong to this category. Numerous varieties of snails, spiders, scorpions and similar animals were evolved under the circumstances. By the time that the Permian[3], as the last subdivision of the Palae-Ozoic age is termed, ended, the amphibia gave place to Reptiles. During the close of the Palae-Ozoic or Permian part of it, it is believed, the major portion of the land hemisphere was under ice. North America was then connected with Europe, South America with Africa, and Australia with Asia. Thousands of the old plants and backboneless animals perished for ever in the cold, and then the golden age of the reptiles came. The reptiles differed from the amphibia in laying eggs and in living, during the early stages, not under water but in air. They were characterised by big bellies and weak legs. Not much removed from the amphibia in the early stages of their development, they wallowed, just as the crocodile does to-day. It is believed that a variety of the tortoise, the crocodile, the alligator and the more poisonous[1] snakes are living representatives of ancient reptiles.

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[1] The later *avatars* are believed by one school to indicate the further stages of evolution. There is a fairly respectable literature upon it.

[2] Soft-bodied but hard-shelled animals like snails, cuttle-fish, oyster, etc.

[3] The term is from Perim—a province of E. Russia. This uppermost division of the Palæ-ozoic series of strata consisted of red sandstone and magnesium lime-stone.

Side by side with the development of the aquatic animals into animals suited for land life, there was, in the course of Palae-Ozoic age, a simultaneous adaptation of the water plants for development on dry land. They acquired, for instance, a woody fibre which could resist heat and light. During the Palae-Ozoic age, there were numerous lagoons and shallow seas everywhere; there was therefore a phenomenal and extraordinary growth of plant life. Many of the plants took the form of huge trees, the remains of which can be seen in the fossils of the period. Some of the trees were more than a hundred feet high, many varieties have vanished. With their stems in water, they formed gigantic swamp forests, the size of which it is hard to conceive in the present day. It is out of these primeval woods that the coal seams, so indispensable for modern civilization, were developed. It may be added that the Palae-Ozoic age did not as yet include flowering plants and grasses; nor did the then world know the modern insects, beasts or birds.

As regards the chronology of the Palae-Ozoic epoch, it may be noted that Dr. Hayden would attribute the first formation of fish to between 300 and 400 million years ago.

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[1] An imaginative friend of mine suggested that this explains the name *Adisesha* !

Mr. H. G. Wells would assign the early Palae-Ozoic age, the age of sea scorpions and trilobites, to about 300 million years ago and the later Palae-Ozoic age of fishes, amphibia and swamp (carboniferous or coal producing) forests to the period ranging from about 260 million years ago to about 150 million years ago.

Indian geologists use the term Dravidian to indicate the Palae-Ozoic age and its sub-divisions. There is no trace of any fossiliferous strata belonging to these periods in the peninsular region, the Archaean, Cuddapah and Vindhyan systems being, though sedimentary, still unfossiliferous and more ancient than the Cambrian. On the other hand, the fossils of this age have been found in the 'extra-peninsular' area. In the Salt Range there occur the Cambrian strata; in the Central Himalayas, the strata of the Cambrian as well as subsequent epochs; and in Burma and Shan States, the Silurian and Devonian fossils. Carboniferous strata have been traced in parts of the Punjab, Kashmir and Baluchistan amidst later volcanic upheavals. The Cambrian strata of the Salt Range—the oldest of the fossiliferous type known in India—are found in the midst of later and younger materials of the Tertiary age, but the latter can be easily distinguished from the more ancient. Geologists divide the Cambrian fossils of the Range into various series; but it is enough for our purpose to note that they include such types as the purple sandstones[1] which reveal ripple marks characteristic of a sandy shore; dark-coloured shales[2]; cream-coloured 'dolomites'[3] which are sometimes 150 feet thick and which indicate, by the presence of the remains of animals (called *Neobolus* and *Redlichia*) resembling the Cambrian trilobites of Europe and America, submergence under a deep sea; the 'sandy dolomite' containing a peculiar mollusc (Stenothica) resembling an American type; and 'sandy models of cubic crystals' left by the evaporation of the sea which covered the area during the period. The Central Himalayas are a storehouse of strata from the Cambrian to the Carboniferous ages. They have afforded, in the midst of later formations, shaly beds and 'dolomitic limestones' where several trilobites have been found. There are also coral limestones' of the Silurian period as in 'Gothland'; and layers of limestone, shale and quartzite containing the remains of 'brachypods' and trilobites attributable to the later Palae-Ozoic periods. The Palae-Ozoic fossiliferous rocks of Chitral have revealed corals of the British Upper Silurian type and brachypods of Devonian as well as Southern Chinese affinities. The Palae-Ozoic rocks of Burma and the Shan States have revealed calcareous shales and limestones resembling the Ordovician system in Europe and America, together with trilobites, groptolites and the Devonian coral.

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[1] In Britain these rocks, formed of compressed sand, are divided into old, new and red types, the last of which is carboniferous.

[2] Shales are kinds of clay, splitting into thin plates like slate but softer and less solid.

[3] Rocks of carbonate of lime and magnesia. The variety was named after a French geologist Dolomieu who lived in the close of the 18th *century*.

THE MES-OZOIC EPOCH (EARLY ARYAN OR SECONDARY)

The Palae-Ozoic epoch was followed by Mes-Ozoic, which has been usually subdivided into the successive ages of Triassic, Jurassic [1] and Cretaceous.[2] During these periods tremendous physical convulsions took place in every part of the world, permanently and considerably altering the distribution of land and water. India of course had a share in these changes. The net result was, she became an integral part of a great continent, generally styled Gondwana[3] which extended as far as South Africa on the one hand and, across Australia, as far as South America on the other. There also occurred in this age, within the confines of India, extensive earth-movements which resulted in the formation of new mountains. These, it has been inferred, were elevated enough to allow glaciers (as in the present

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[1] Named from the Jura mountains between France and Switzerland. The variety is rich in limestone.

[2] Chalky.

[3] Earlier writers termed it Lemuria.

Himalayas) to be formed. The country was therefore in this period a very elevated, cold plateau. The highest portions of this cold plateau were south of the Aravallis, the Himalayas being only a low coast line bordering the Tibetan sea already referred to. This 'Puranic' sea underwent gigantic changes in immediately subsequent times. It became broader and more extensive, spreading westward as far as the Mediterranean, so as to cover even Northern Africa. It also extended to the east, completely separating Gondwana from the further north. This Eur-Asiatic ocean has been called the Tethys. As Sir T. H. Holland observes, it "flowed over a belt stretching across Central Asia, leaving deposits in which the fossil contents of places so widely separated as Burma, China, the Central Himalayas, Siberia and Europe, show the marked affinities due to free migration in the ocean."

Still another change in this age was, the Gondwana area was broken up, here and there, by occasional depressions which were filled with sedimentary deposits, thousands of feet in thickness. These deposits, it is believed, brought about a general subsidence of the whole land. It is in these deposits that we have the coal-bearing seams of India. Geologists point out that, while the fossil remains, animal and vegetable, of this period in South India resemble those of South Africa, Australia and even portions of distant America, proving the existence of the Gondwana continent and free movements of animals and negotiations of plants throughout its area, the remains of marine animals in the sediments of the sea which adjoined Gondwana and the upheaved hills of Kashmir and the Himalayan axis (which was then under water) are allied to those of similar formations in Europe, proving thereby free communication between this sea and the European sea.

At the Mes-Ozoic epoch advanced, fresh changes took place both in the physical and animal world. The Tethys receded westward, as the result of which China became land, though for some time the Himalayas, Afghanistan, Baluchistan and the Pamir plateau were still covered by the sea and subject to the same deposits as the Alps. The

Salt Range of the Punjab, on the contrary, became a land surface in this period. It is believed that the Tethys occasionally encroached into the interior of Gondwana ; for we find traces of such marine deposits in Rajputana, Cutch, Trichinopoly, Chingleput and Nellore. The southern sea also had occasional transgressions, to judge from some deposits in Assam, Trichinopoly and Pondicherry.

It was in the earlier course of the Mes-Ozoic epoch that the bigger reptiles and birds were evolved, as land and air life advanced. The reptiles, instead of wallowing on swamps, could stand up, go on fours and "balance themselves on tail and hind-legs rather as the Kangaroos do, in order to release the fore-limbs for grasping food." (*Wells*) The remains of many reptiles in this period indicate the transition from water to land life and from the reptilian to mammalian features. Some of these were gigantic in size, sometime a 100 feet long. The most famous examples of this type are the Plisiosaurs and Ichthyosaurs—huge things loving water (like whales)—the Dinosaurs[1], the Atlantosaurs the Tyrannosaurs and other monstrous varieties discovered in Africa, Russia, China and other parts of the world. In India the remains of such animals have been discovered in the cretaceous (chalky) fossils in the vicinity of Jubbulpore in the Central Provinces and Trichinopoly or rather Ariyalur in Madras Presidency. The hills near Jubbulpore were noted as early as 1828 by Col. Sleeman for their petrified trees and fossilised bones. In 1868 Lydekker identified some of these bones as those of a saurepod Dinosaur—a fact indicating the existence of this part of the country long before the appearance of man. In 1917 Dr. C. A. Matley the eminent palaeontologist made a systematic survey of the area and came across certain finds equal in importance to those of the Gobi desert revealed by American explorers. Dr. Matley came across a number of well-preserved bones of the reptile above-mentioned and also of the carnivorous (Theropod) Dinosaur, besides some hitherto unknown types of the same. Some of the bones indicated that their owners could not have been less than 60 feet long. From the fact that some 5000 scutes or scales were also discovered it has been inferred that some of these reptiles were protected by armour. Dr. Matley's excavations yielded 32 boxes of bone material, the study of which by the British Museum showed that the armoured Dinosaur of India did not only possess special characteristics but was the only individual of the armoured group so far discovered in Asian deposits. The Indian Dinosaur, the nearest neighbour of which was the Stegosaur of Tanganyika, differed from the latter both generally and specifically. As has been already said, it has been assigned to the Lameta age, that is, the age of limestone beds so-called from Lameta Ghat in the Cental Provinces which was deposited by water in the Cretaceous age. The remains were carried to the sites of their discovery by strong currents which swept over the area long before the advent of man.

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[1] Gigantic extinct species of reptiles, meaning literally terrible lizards. All similar animals ending in *saurus* belong to the lizard variety.

Till 1925 there was only one *clear* example of the Dinosaur in India—the Jubbulpore one. Recent researches[1] have shown that it existed in South India too, in the Trichinopoly rocks of the Cretaceous period. In 1857-60, Dr. Blanford made a survey of the area around Ariyalur and discovered remains of Dinosaurs at the village of Kalmedu. Between 1924 and 1928 Prof. Sampat Aiyangar of Mysore and his students thoroughly explored the region for reptilian remains and discovered those of the type called Megalosaurus[2] the existence of which had been surmised years ago by the great geologist Lydekker on the basis of a single tooth, side by side with those of the types called Sauropodous and Stegosaurus the existence of which was definitely known from their comparatively numerous remains. A single bone discovered near Kalmedu has also been surmised to be that of Dinosaur, though the study of it is not yet complete.

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[1] For an account of these see the two articles in the *Hindu* of May 29 and June 7, 1929, the former of which is a reproduction from the *Pioneer* and the latter an original note by Mr. L. Rama Rao of the Central College, Bangalore. In the former the recent researches on the subject by the Geological Department are excellently summarised, and in the latter what has seen done in the same field by the Geological Department of the Central College.

[2] Literally, the great lizard.

Meanwhile Dr. C. A. Matley carried on, from 1925 onward, researches in the same field with the help of the Geological Department of India. He discovered in the red-clay bed of the Kalmedu water-course as many as ten pieces of girdle bones which, he asserts, could have been only Dinosaurian. Dr. Matley also came across, at a village called Neykkulam, a number of remains of the Reptile types of the carapace,[1] etc. He believes that, though his own finds are not conclusive, the Dinosaurian remains discovered by the Mysore scholars "are of importance as it is the first time that Southern India has yielded *identifiable* remains of Dinosaurs."

One class of reptiles developed into birds by acquiring features for protecting themselves from the weather. The distinction between birds and reptiles is that the former possess the beak while the latter have teeth. The earliest birds show traces of the transition stage. The teeth linger even now in some of the birds of the cold Arctic and Antarctic seas.

In the latter part of the Mes-Ozoic period, there was, for some unknown reason, a tremendous revolution in animal and plant life. All the reptilian orders ceased to exist, leaving no descendants except a few types of lizards, crocodiles, turtles, and tortoises. Even in the seas the Ammonite species of animals,[2] the chief characteristic of which was the possession of coiled shells, vanished, leaving an isolated genus—the pearly Nautilus[3] of the warm Indian and Pacific oceans—to carry on their type in the next geological epoch. It has been suggested that this extinction of the whole Mes-Ozoic animal and plant world, which Wells regards as the most striking revolution in the history of the earth before the appearance of mankind, was probably the result of a cataclysmal change from a hot climate to one of prolonged cold. At the end of this cold age, that is, at the beginning of the Cain-Ozoic age, we find an entirely new

[1] Aquatic animals with hard shells like crabs and lobsters.

[2] Ammon is jupiter with coiled horns. *Ammontie* is therefore used to denote coil-shaped fossil shells.

[3] It is a mollusc formerly supposed to sail on sea.

order of animals, namely the Mammals. These were distinguished from the reptiles and birds by the possession of hair, which was only second in warmth-holding power to the feathers of the birds. The possession of hair enabled them to tide over the prolonged cold which the reptiles were not able to survive. Such mammalian remains have been discovered in India. Two of the most interesting types of these are the *Bos buffelos* and the *Equus*. As regards the chronology of the Mes-Ozoic epoch it has been placed between 150 and 50 or 40 million years ago.

THE CAIN-OZOIC EPOCH

The next geological epoch in the world's history is the Cain-Ozoic or the Tertiary (later Aryan) epoch. It has been assigned to the vast period ranging from 40 million years ago to 600,000 years ago. It has been divided into the Eocene,[1] the Oligocene,[2] the Miocene[3] and the Pliocene[4] sub-ages, each of which lasted for millions of years. Throughout this period, the world was, it is believed, changing in climate. There was also a gigantic crumpling of the earth's crust, causing earthquakes and volcanic eruptions, as a result of which most of the mountains and seas of the modern world came to have their present configurations. The Andes in America and the Alps in Europe are such Cain-Ozoic formations. Similarly in India "successive layers of lava sheets welled up from below and spread over the country levelling its surface like a gigantic deluge." The older rocks were than covered by layers of black basalt thrown up from below, in some places 600 feet thick. Occasionally there were intervals of rest and there were formed beds of mud and gravel containing fresh-water shells, found for considerable depths below the basalt surface. "The levelling effect of the lava flow has" says Sir Bampfylde Fuller[5], "left its mark in the existing scenery of the upper portion of the peninsula. The hills are generally flat-topped, bounding the view by successions of terraces, and where the basalt has been much denuded, as along the western coast above Bombay, there remain, as monuments of a more ancient level, flattened topped pinnacles of grotesque appearance, which stand above the country like tall fortresses, and in the disturbed days of Indian History have been convenient strongholds for marauding or insurgent forces."

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[1] Eocene = dawn-new.

[2] Oligocene = little new.

[3] Miocene = less new.

[4] Pliocene = more new.

[5] See his *Empire of India*, 1913, pp. 4-5. Basalt is dark, dark-green, or brown igneous rock, often in columnar strata.

The next change in the course of the Cen-Ozoic epoch, was in connection with the Tethys. It became, in consequence of the accumulation of marine sediments, shallower and shallower. As the result of this, its bed became the present Himalayan and Tibetan uplands with their imposing height of 20,000 feet above the sea. The greatest and loftiest mountain chain of the globe thus slowly emerged out, in several intermittent phases, so that, by the end of the Pliocene age and the beginning of the Pleistocene (literally, most new) age, it assumed its present form.[1] Volcanic actions of immense dimensions then gave rise to the serried and ridge-like elevations of Baluchistan, N. W. Himalayas[2] and Kumaon, as well as the uplands of Burma and the Himalayan peaks. At the same time, throughout the millenniums when the Himalayan mountain was thus building, there was a subsidence of the land between that mountain and the Dakkan plateau. As the Himalayas became higher and higher, this trough became deeper and deeper. It then received, both from north and south, the deposits and drains of numerous rivers, and became, owing to the folding and corrugation of the earth, full of streams, swamps and lagoons. In the midst of these vast accumulations of silt and deposit brought from either side of the trough, were formed the coal seams and petroleum deposits for which Burma, Assam and Baluchistan are famous. In subsequent times, as the Pleistocene or quarternary age advanced, the Gondwana land itself broke up, and large parts of it were submerged under the sea, so that the connection between India and Africa on the one hand and Australia, on the other, was gradually obliterated[1]. The immediate result of the formation of the Indian ocean was that the lagoons and lakes of the newly-forming Hindustan valley were drained by a river which formed one of the two main forerunners of the present Indus, Ganges and the Brahmaputra. This river, it has been ascertained, first flowed along the foot of the hills in a north-west direction[1]. It had its origin somewhere in Bhutan, received in its course the silt-carrying tributaries from the newly-formed hills, and, flowing through the Punjab, turned to the south, where it joined the sea like the Indus in the present day. This river, called the Indo-Brahm, was on the southern side of the preliminary Himalayan chain. On the northern side of the rising hills there was another river called the Tsampo which, like the southern river, flowed in a north-westerly direction. It either joined the Oxus or entered the Arabian Sea, either independently or through the Indo-Brahm. Volcanic activity then led to a change in the direction of the northern river. It became split up into two rivers, one flowing eastward to form the present Brahmaputra, and the other westward to form, in the Ladak valley, the upper waters of the present Indus. The Indo-Brahm at the same time gave rise, thanks to the upheaval of the Burmese hills and the subsidence of Hindustan, to the two systems of the Ganges and lower Brahmaputra. The voluminous waters of the middle Indo-Brahm gathered themselves into the Ganges and captured the Jumna which had originally flowed westward through Rajputana. The lower portion of the Indo-Brahm, which had flowed through the Punjab, came to have its five modern forms, together with the extinct Goghra and the Sarasvati. The last of these was apparently a big river. Joined by the Sutlej and not improbably by the Jumna (till the latter was captured by the Ganges), it crossed the plains of the Punjab and became, in the Vedic period, the holiest of the Aryan rivers. The Sutlej did not join the Beas till late in historic times.

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[1] It has been maintained that the shell-fish, owing to the action of which the Himalayas rose out of the sea-bottom, was the first manifestation of God in living shape and that is why the *Saligram* came to be worshipped in India. "The mythic stories and Puranas and Itihasas like Bhagiratha's part in bringing the Ganges down from the top of the Himalayas," says Mr. P. T. Srinivasa Aiyengar, "are but dim, faint memories of those ancient days when the world north of the Vindhyas was first being raised out of the ocean." In his Presidential address to the 11th Indian Science Congress, Dr. N. Annandale has made an illuminating study of the shells, (among other subjects like frogs, plants, etc.,) as found in India and elsewhere in elucidation of the two types of evolution, convergent and divergent.

[2] The picturesque pages of Molyneux and Sir F. E. Younghusband in their *Kashmir* (A. C. Black) give the fascinating history of the *Kashmir* geology.

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[1] The literature in connection with the disappearance of Gondwana is rather perplexing so far as the exact time is concerned. On the whole we may attribute it to late Tertiary and early Pleistocene Ages. Different portions probably subsided in different times. In 1905 the sounding vessel *Sea Lark* showed from the ocean-depth that Madagascar probably separated earlier in the Tertiary period. But the attraction of the Himalaya affected both the sea-level and upheaval of the islands in the Arabian sea and probably made communications easy in later times. See *Proceedings of 10th Indian Science Congress*, pp. 151 and 154. R.A. Wallace points out that Australia was detached earlier. He infers from the cleavage in the middle of East Indies, that the Eastern part was detached from very remote times with the rest of Asia. The fauna of the Philippines differ in material respects from that of Asia thus indicating very early separation. "When we go to Celebes and Bali we enter on a new world altogether. It is well known that the natural productions of Australia differ from those of Asia, more than those of any of the four ancient quarters of the world differ from each other; Australia in fact stands alone; it possesses no apes or monkeys, no cats or tigers, wolves, bears, hyænas, no deer or antelopes, sheep or oxen, no elephant, horse, squirrel or rabit, none in short of those familiar types of quadruped which one met with in every other part of world. Instead of these, it has marsuphals only, kangaroos, opossums, wombats and the duck-billed *platypus*. In birds it is almost as peculiar." But the contrary view seems to be also in the field. Many animals like the elephant and Tapir of Sumatra and Java, the rhinoceros of Sumatra and the allied species of Java, the wild cattle of Borneo, and the kind long supposed to be peculiar to Java are now known to occupy some part or other of the Asiatic mainland. Further, even after the formation of Oceania, there was always facility enough for communications. For an interesting contribution on the African rift and its connection with India by J. W. Gregory, see *Nature*, October 1923, pp. 514-6.

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[1] Sir Subrahmanya Lecture, 1916. One evidence "in support of the theory of one big westwardly flowing river forming the immediate ancestor of the Indus, the Ganges and the Brahmaputra is furnished by the discovery of two closely allied species of Creataceans or Dolphins and also Chelonia or turtles found living both in the Ganges, Indus and Brahmaputra rivers. Dr. Annandale of the Zoological survey has given it as his opinion that the freshwater Cretacean found in the Indus is absolutely identical with that of the Ganges and different altogether from the cretacean and Chelonian found in the Irawady and the Mahanadi."

The Indus system was in a flux even till the Mahomedan period of Indian History.

It should be now obvious that the Himalayan system with its extensive ramifications is quite young when compared with the Dakkan and further south. The latter in fact is not only the oldest portion of India but also the remnant of perhaps the oldest region of the globe. The peninsular mountains, though not so elevated as the northern, are more ancient. The Western Ghats are the memorials of the water-shed which separated the eastern half of ancient Gondwana from the western before the latter was submerged under the Arabian Sea. That is why the peninsular rivers have their source in the Western Ghats almost at sight of the Arabian Sea and flow right across the peninsula eastward to meet the Bay of Bengal. Slight upheavals of later times have apparently slightly raised the height of the Ghats and given rise to irregular depressions like the valleys along which the Narbada and the Tapti flow in the opposite direction; but by the close of the Tertiary age South India as well as North India had practically assumed its present configuration.

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The Tertiary age did not only see the mountain and river systems of India (as of the other parts of the world) assuming their present forms, but also anticipated many of the features of the modern animal[1] and plant life. The most important change in animal life was the development of mammals which differed from the reptiles in possessing the efficient hairy protection from cold and in bringing forth, instead of laying egg, young ones and tending them in a family spirit, characterised by the principles of social association, tradition, continuity. It is from this time that the young begin to imitate the adult and the mother lovingly directs development. The degree of educatability of course differed in different mammals, but the general character was the same and it has reached perfection in Man. Some of the earliest mammals which belonged to the Eocene period were herbivorous quadrupeds, some leapers, some climbers of trees, some swimmers and so on. Many of these were the early predecessors of living forms like the horse, the camel, the pig, the hedge-hog, the monkey, the lemur and the rhinoceros. Only, their brain capacity was much smaller; sometimes less than one-tenth of the capacity of their present representatives.

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[1] It was in this period that Europe first had the birch, the beech, the holly, the tulip, the ivy, besides many fruit trees, flowers, palm and grass. Among the animals, bees, butterflies and mammals became abundant. It may be noted that, during the Tertiary period, America was connected with Asia and so communication was easy It was only after the Pleistocene age that the Behring Straits came into existence by the action of glaciers and then the camel became confined to the old world and the llama to the new.

In a very interesting paper read before the Indian Science Congress of January 1925, Dr Pilgrim[1] has dwelt upon the mammals of Miocene India and their origins. He points out that in those days the negotiations of fauna and flora between India, Africa, America and China (particularly Mongolia which has been the subject of special explorations of specialists) were very common. The types found in every one of these contributed to the evolution of the reptilian and mammalian series. As elsewhere India was indigenous in some respects and got immigrants from others. The first glimpse of the mammal in India according to Dr. Pilgrim is that discovered by Dr. Cotter in Pakoku district, Burma. He traces the Indian Titanotheros, the ancestor of the early tapir (an animal allied to the rhinoceros and the pig) to migration from North America and the earliest pigs from Africa of the lower Miocene age. These early Indian pigs are said to have been discovered in the early Eocene of Burma and the lower Miocene of Baluchistan. Dr. Pilgrim's theory is that they differed from the true pigs in the structure of the teeth, that the latter also were immigrants into India and that still later the Indian type gave rise to the modern types of the world. Evidently the champions of the *Varahavatara* can give a scientific explanation for the importance of the *Varaha* in the evolution of life!

Another conspicuous mammal of the age was the hippopotamus. It first appears in the lower Pliocene of

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[1] Dr. Pilgrim and E. Vredenburg (d. 1923) have made valuable contributions on Indian Tertiary animals.

India and was, according to Dr. Pilgrim, an immigrant from some unknown country. He surmises that it might have been the *jalahasti* of Sanskrit literature and might have lived in human memory. Africa however was the true home of the hippopotamus. An aberrant modern type of the animal has been discovered in the lower Miocene bed of Baluchistan.

Camels are believed to have been seen for the first time in the Eocene of North America and it is believed that during the upper Pliocene period they migrated into Central Asia and India and never into Europe.

The early horses are also believed to have originated in North America; but the development of the three-toed hipparian and one-toed equus are believed to have been developed in Central Asia and emigrated from there to India.

The true elephant was an indigenous development in India, its immediate ancestor being the Stegodon. The African elephant was a distinct variety and, it is stated, might have originated in Europe. It was an immigrant into India during the pre-glacial age and then died, giving place to the purely Indian breed in the future. The African elephant first had a snout but afterwards developed the trunk.

To the same period must be assigned the rise of giraffes, llama, etc. After the glacial age and the formation of the Behring Strait the camel became confined to the Old World and the llamas to the New.

It is believed that the difference in the fauna of India from that of Europe was due to the fact that they were long separated by a big lake. When the lake dried up, acquaintance began once again. The three-toed horse, the gazelles and antelopes, the true dogs and cats were developed in Central Asia and migrated to Europe, Africa and India. India had no doubt its autochthons as she had the exotic immigrants. It was one of the former that gave rise to the oxen which, by succeeding migrations, became world-wide animals The humped ox is believed to be a late neolithic development. The growth of dogs, cats and the peculiar type of the sabre-toothed tiger are believed to have taken place in pursuit of huge gramnivorous brutes which arose in this age owing to the growth of grass, another important feature of the age.

Lastly, primates made great progress. Dr. Pilgrim is disposed to think that they had their origin in North America. The most primitive members were the lemurs which migrated to other parts of the world. The anthropoid ape has been found in the lower Oligocene of Egypt but the presence of a large number of types in India is believed to prove India as their chief area of development. Dr. Pilgrim is for the theory of the development of the anthropoid into man in India. He does not believe that the Java theory is adequate.

The last of the mammals to come into the scene was Man. We shall study the origin and evolution of this greatest of mammals in the next chapter, a study which will enable us to see that India occupied by no means an unimportant place in his history.

BIBLIOGRAPHY

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CHAPTER II

EARLY MAN IN INDIA

The most outstanding, rather the crowning, event in the course of the evolution of life in the Tertiary age was the origin of Man. Various theories have been in vogue regarding the evolution of man. According to one view, he was gradually evolved out of one type of the mammal, namely, the ape, through the successive stages of the gibbon, the orang-u-tan, the chimpanzee and the gorilla ; according to another he was evolved from a parallel or similar type of primates but different from the ape in the possession of an innate capacity for ground life and for the development of the brain power which stands at the bottom of all distinction between man and other forms of creation. An equally interesting and speculative question is whether man, either as the descendant of the ape or as that of a similar but different being, was monogenic or polygenic. According to the monogenists he was evolved at a particular area in the world and slowly spread from there to the different parts, while according to the polygenists there were probably different types of men from the very beginning of his existence. On the whole, the strict application of the theory of evolution and the absence of any fundamental distinction either in the anatomy or in the capacity for mixture between the least and the most advanced types of mankind, seem to have placed the monogenic theory, from the time of Darwin onward, comparatively in the foreground. But it would not be a true representation of things to ignore the fact that several modern scholars have given the weight of their support to the theory of the existence of several species from the very beginning.

With regard to the question of man's birth-place, that is, the exact locality where he was evolved, it is a theme which of course does not interest the polygenists; but even amongst them there are those who hold that man belonged to a *collective* species and that this species might have originated in a single region and spread from there to other parts of the world. To the monogenists, it is plain that man must have been originally evolved in a single locality, though there is considerable difference of opinion among them as to the exact locality. Scholars with a biblical turn of mind[1] have surmised Syria to be the birth-place of Man. Some have preferred Western Asia, some Central Asia, some Burma, some the Arctic regions (which in those days had a tropical climate), some Africa, and so on. One thing is now regarded as certain, namely, that Man, being on the whole a hairless animal, was evolved in a hot region like Africa, India or further Asia. There was a time when the 'boreal theory' of Quatrefages assigning man's birth-place to the Arctic region in Europe held the field; but it is now on the whole discredited.[2]

One argument in favour of Africa is that the chimpanzee and the gorilla have been found most commonly in its tropical jungles. In February 1925, Dr. Hart, Professor of Anatomy in the medical school at Johannesburg, unearthed, fifty feet below the surface of a lime-stone bluff eighty miles north of Kimberley, the fossil remains of a man-ape, the Australopithecus as it has been called, which is described by Sir Arthur Keith as the most brutal type of humanity yet discovered.[3] As the site of this interesting find

[1] Dr. Wright maintains in his *Origin and Antiquity of Man* (1913) that he was created 15000 years ago in Central Asia! Dr. Hadden places Man's origin in Southern Asia (see his *Wanderings of peoples*. p. 15).

[2] Avebury says that "though we know that during parts of the Miocene period the climate of Europe was warmer than at present, so that monkeys lived north of their present limits, still it is in the warmer regions of the earth that we may reasonably find the earliest traces of the human race." (*Prehistoric Times*, 1900).

[3] The chief original authorities are Linnaeus (*Systema naturae*. 1735); Dr. Prichard (*Natural History of Man*, 1843); A. R. Wallace (*Natural Selection 1871*); Huxley's Essays; Darwin's (*Origin of species* 1859 and *Descent of Man* 1871). These have been supplemented by Quatrefages (*History of the Human Race* 1889); Tylor (*Anthropology*, 1876); Keane (*Ethnology*, 1896); Sergi (*Mediterranean Race* 1889); Ratzel *History of Mankind* 1897) Hadden (*study* of *man*); MacCurdy (*Human Origin* 1924) and others, like Deniker, Ripley, etc. In September

is nearly 2000 miles off from the region of the chimpanzee and the gorilla, Dr. Hart suggested that the Australopithecus must have been an ape which had adopted a human gait and wandered in search of subsistence from its original tropical jungle home. Sir Arthur Keith however points out that, though the reduced jaw of the Australopithecus shows a human development, it still evinces a curious blend of the chimpanzee and gorilla; that the brain volume is the same as that of the latter; and that "though it is a form nearer to the source from which Man sprang than any other form hitherto known to us," it is doubtful whether it had a human posture or gait, as its appearance so far south might be due to the fact that the climate of South Africa was then probably tropical. In any case, points out Sir Arthur Keith, the Australopithecus cannot have been the missing link between the anthropoid and man.

This place, he opines, must be accorded to the Pithecanthropus of Java. This Pithecanthropus (ape-man) is the name given to an animal which had a remote resemblance to man, the remains of which were discovered at a village called Trinil in Java in 1891 by a Dutch savant, Dr. Eugene Dubois. Only the top of the skull, a few teeth and a thigh-bone were discovered; but this little trayful of bony fragments, to use the expressive language of Mr. H. G. Wells,[1] is at present, apart from stone implements, the oldest relic of humanity that is known. Palaeontologists have been able to construct the whole figure of which these fragments formed parts; and it is now agreed that the Pithecanthropus Erectus was a being intermediate between the higher ape and man. Its brain case was much larger than that of the chimpanzee and smaller than that of man. For an ape's the brain was enormous, and for a man's it was the brain of an idiot. The thigh-bone evidences a creature which could

[1] *Outline of History*, p. 33. Osborn's *Men of the old Stone Age*, 1918.

1927 before the British Association Sir Arthur Keith made a spirited defence of the Darwinian theory of evolution. It is a capital summary of the researches on the subject. See also his *Antiquity of Man*. 1916, for an earlier stage in the progress of the subject.

stand erect and run and which could therefore use its hands like a human being. On September 29, 1926, there was published in the chief newspapers of the world a telegram that Professor Hebelin found in the same village a complete skull of the Pithecanthropus Erectus, thus discovering after all the missing link. The whole world of scholarship was in a tip-toe of high expectations in connection with this; but subsequent scrutiny revealed the fact that it was not a blood-relation of early humanity. The Pithecanthropus remains even to-day the supposed link between the anthropoid and man and that Java was, in the opinion of many, not improbably the birth-place of 'the noblest creation of God.'

A slightly different view is that the origin of man must be looked for in the Austral continent before it was broken up by the cataclysms of the late Miocene and Pliocene ages. "In Miocene times," says Mr. A. M. Quiggin, "there was an almost continuous land connection between Europe and Africa, and the Mediterranean sea did not exist. In Pliocene times the Mediterranean, Black and Caspian seas consisted of a chain of great lakes. The Strait of Gibralter was not yet formed. Scicily was then connected with Tunis and Greece with Libya. Thus there were many means of communication between Africa and Europe, both for animals and for man." Mr. Quiggin goes on to point out how, when we examine the present distribution of the anthropoid forms allied to man, we find that the gibbon and orang-u-tan live in South-east Asia and the Malay regions, while the chimpanzee and gorilla are seen in tropical Africa. From this he concludes that man probably "developed somewhere on the Austral continent, now sunk beneath the Indian ocean," and spread from there to all parts of the globe. "It has been assumed as a hypothesis that the human *type* or *types* originated somehow in these parts in Pliocene times, and migrating thence in all directions, became deversified in response to varied conditions. We know how animals adapt themselves to their surroundings. For example, the stoads which live in northern lands, though reddish-brown in the summer, change in the winter into a snowy white except for the black tips to their tails...Texture may vary as well as colour, which are not needed by their relatives in warm parts. Compare for example, the thick shaggy hair of a shetland pony with the smooth silky coat of a race-horse. In the same way man may have developed variations to accommodate himself to his environment. The thick woolly hair of the Negro affords protection in a tropical climate, though unnecessary in more temperate regions, and his black skin is undoubtedly useful in the rays of a tropical sun. The influence of climate and food and other external factors on human evolution has only lately begun to attract serious attention, and much is still obscure. It suggests a possible explanation for the existing variations of mankind."

A logical inference from this view is that the disappearance of that part of 'Lemuria' which now forms the bed of the Indian Ocean must have taken place subsequent to the evolution of man in the late Miocene and early Pliocene epochs, the formation of the Hindustan valley and of the systems of the Ganges, Brahmaputra and the Indus being a still later development. Mr. A. C. Logan[1] is very sceptical in regard to the view that Indo-Africa was the cradle of mankind; because, according to both Dr. Blanford and Dr. Graham, the two greatest Indian geologists who upheld the existence of the Austral continent, it was submerged *before* the commencement of the Tertiary era. Logan was therefore inclined to the 'boreal' theory of Quatrefages[2] that man originated in the Arctic regions under the semi-tropical conditions of the Tertiary period and thence dispersed southward before the growing cold. But scholars are not inclined nowadays to attribute the disappearance of Eur-Africa to such an early age. Some carry it, as has been already said, to late Miocene and early Pliocene epochs, and much of Logan's argument falls to the ground. Keane postulates a Pliocene *precursor* of man, who spread from the Indo-African continent eastwards into India and the rest of Asia and westwards into Africa and ultimately Europe.

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[1] Author of the *Chipped Stones of India*, Calcutta, 1908.

[2] *History of Human Races*, 1889.

Opinions have of late swung round India as the birth-place of humanity, though amongst the advocates of the Indian theory there are difference of opinion as to the exact locality where it happened. It has been maintained by eminent geologists that an earlier stage in the evolution of man than the Pithecanthropus itself is represented by the Dryopithecus, an ape of the Miocene age with a very human-looking jaw, the Sivapithecus, and the Palaeopithecus, all of which have been found among the fossils of the Sewalik hills which extend for 200 miles in the lower Himalayas from Hardwar to the north-west. Dr. Pilgrim,[1] for example, points out that the molar teeth of the Sivapithecus indicate that it approaches the human form more than any other type of the Simidae, extinct and living. Joseph Barrel suggested that it was during the uplift of the Himalayas at the end of the Miocene and beginning of the Pliocene ages that primitive man probably originated. "As the land rose," he says,[2] "temperature would be lowered, and some of the apes which had hitherto lived in the warm forest would be trapped to the north of the raised area. As comparatively dry plains would there take the place of forests, and as the apes could no longer migrate southwards, those that survived must have become adapted for living on the ground, and acquired carnivorous instead of frugivorous habits. By continued development of the brain and increase in bodily size, such ground-apes would tend to become man." In his presidential address before the Asiatic Society of Bengal in 1919, Dr. Hayden similarly observed that the mammalian development in the Sewalic rocks of the Himalaya and the Punjab shows that the last stage in the development of the mammal into man must have taken place there.

On the other hand, it has been suggested that South

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[1] Panchanan Mitra's *Pre-historic India* (1927, pp. 110—14)

[2] "New Siwalik primates and their bearing on the question of the evolution of Man and the Anthropoidae" in *the Records of the geological Survey* for 1915. See also Rev. E. O. James' *Introduction to Anthropology* (1919) pp. 61.

India, the heart of ancient Gondwana, was the original birth-place of man, and that it was from there that he spread to other parts of the world. It has been observed that the ancient Dandakaranya which figures so much in the Ramayana as the abode of the man-like monkeys was the area of the evolution. Mr. P. T. Srinivasa Aiyangar[1] whose researches on the subject are singularly suggestive and valuable, argues that man must have had his birth in the plateau immediately to the south of the Dandakaranya. He points out that the earliest implements of man are found only in South India, thus showing that, if man was evolved at all in India, he could not have come into being either in the cold Himalayan land or in the dense, beast-infested forest of the Dakkan. Nor could he have lived, he points out, on tops of mountains or the low river valleys (like those of the Kaveri and Godaveri), as they would not only have been unhealthy but lacked in all those roots and nuts on which early man subsisted. Mr. Srinivasa Aiyangar therefore concludes that man must have originated in the fairly high-levelled region of central South India, the country of small hills adjacent to river valleys, where he could command the necessary water, fruits and nuts.

It is difficult to say which of these views can be positively accepted; but it must be pointed that, in the opinion of Sir Harry Johnston[2], India was 'most probably' the land where the evolution of man took place. Sir Harry considers the case of Syria, Asia, Java, Burma, etc., and concludes that either Burma or the southern part of the Indian continent must have been the birth-place of humanity, preferably the former.

THE EOLITHIC AGE

The most momentous and interesting event, then, in the Tertiary age was the appearance of Man (or rather types of men, as some would prefer to say) and the beginning of his movement over the different parts of the world. Now from the very moment that man appeared he had to live at the expense of the numerous beasts that inhabited the then world, namely the extinct species of the elephant, the horse, the wild ox, the rhinoceros, the hippopotamus, and other terrible competitors. In his struggle with these, man had to arm and provide himself with such weapons as he could make with his primitive, infantile intellect. It is very probable that the art of making implements existed even in the pre-human period. Darwin points out how even baboons opened nuts by breaking them with stones and also fought with the aid of sticks and stones. It is very probable that the Sivapithecus, the Palaeopithecus, the Dryopithecus, and similar pre-human beings were already using such primitive implements. In fact, chipped stones have been found even in the strata of the Oligocene age at Boncelles in Belgium.[1] However it might have been, the earliest implements to be made systematically, deliberately and with an intelligent purpose were the works of the earliest man. The earliest of such human implements have been called Eoliths, literally dawn-stones, called as such in consequence of their appearance during the dawn of humanity. These are chipped out of flints or fragments of stone and of the roughest make possible. The term *Eoliths* to denote the implements previous to those of the Palaeolithic age, was first used by J. Allen Brown in 1892. M. Rutot of Belgium a great authority on Eoliths, discovered many forms of it in that country. Some have used the term Reutelian to denote the Eoliths, after this great savant. But French scholars have preferred the term 'pre-Chellian' to distinguish them. Reid, Moir, Harrison and a host of other scholars have established the place of Eoliths in the history of human culture, thus closing a long period of controversy on the question ; and it is now definitely accepted that there was an Eolithic age previous to the Palaeolithic age. The technical term given to the typical Eolithic implement is the Rostro-carinate (literally ridged like a beak). It has been described as "an implement with a broad posterior region narrowing anteriorly into a quasi-vertical cutting edge", which is curved like the beak of bird. It was apparently used by the savage man for all purposes of attack and peace. As has been already said, the implements of the type are usually known by the name pre-Chellian.

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[1] Sir Subrahmanya Lecture, 1926 p. 3. Mr. P. T. S. adds the argument that the four types of anthropoid apes have been found in South India. I think this is a unique statement. See p. 19 *ante*.

[2] *The Opening up of Africa*, p. 10.

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[1] It has been suggested that the earliest implement used in India were the mace or the club—adopted in consequence as a divine implement in temples—the bow and arrow and the spear in suitable woods as man would have got sufficient facilities. But the use of wooden implements need not have *preceded* stone ones in all cases.

THE DIFFUSION OF EOLITHIC CULTURE

It is very regrettable that no discovery has been made of the human remains of the Eolithic age either in India or Europe or anywhere else. But though no *human remains* have come to light, Eolithic *implements* have been discovered in all parts of the world. These show that this culture was already wide-spread and universal. They go to prove that, by the time when man was able to chip implements he was an inhabitant of a very wide part of the earth. Rostro-carinates have been discovered in a large number of places in Europe. Deniker gives evidences of Eoliths even in America—a view, however, not accepted by others who hold that the earliest American geological remains are introductions in comparatively late times. So far as India is concerned, it is very difficult to say whether any of the numerous artifacts thus far discovered can be definitely attributed to the Eolithic age. According to Bruce Foote, there are no such remains. The earliest implements discovered in India he would assign only to the Palaeolithic period. Others there are, however, who would bring *three* specimens at least under the category of Eoliths. The first of them is a set of flints discovered in a ravine in the slope of the Irawadi in Burma, by Dr. Noetling of the Geological survey, in 1893. (See Records of Geological Survey, Vol. 27 p. 101-2). The discoverer says that he found them in the midst of upper Miocene fossils, more than 4,500 feet thick and containing the remains of extinct species of the rhinoceros and hippotherium antelopium of the Pliocene age. The figures he draws are believed to indicate resemblances to the finds described by Evans and Dawkins in the caves of England. Mr. Panchanan Mitra[1] draws attention to the fact that a particular boucher closely resembles a Dorset Eolith and should be certainly attributed to the earliest Pleistocene times if not earlier still. The finds, in other words, might have been pre-Chellian or at least Chellean. Keane regards it as a very important evidence of the earliest man of the Pliocene period. Logan,[2] on the other hand, maintains that the theory of the Pliocene man could not be maintained "until other implements are found in such positions as to make it certain that they were bedded in the stratum at the time it was being formed." He adds that chip flints of the Pliocene age, two or three millions of years old, can hardly fail to show signs of antiquity in the form of discoloured faces and corroded edges, and that Dr. Noetling's figures on the contrary show clean faces and sharp edges. On the whole the latest opinion seems to take it that the Burma specimens, being irregular-shaped (sometimes triangular and sometimes rectangular) and similar to the Narbada specimen, should be attributed to the same age.

The next specimen[3] which has been attributed to the Eolithic period is a boucher of Vindhyan sandstone discovered by Dr. Hackett at Bhutra in Narsingpur district in the Narbada valley at a depth of about 20 feet from the present surface. As this was found side by side with the bones of some animals which are modern in character and resemble the existing species of the rhinoceros, the elephant, the wild buffalo, the deer and at least one reptile, Bruce Foote would place the Narbada find in the Palaeolithic period. But even he acknowledges that the remains of *some* of the animals indicate *extinct* species of the hippopotamus, the wild ox and other beasts. Some

[1] See his *Pre-historic India*, 1927, pp. 124—127.

[2] *Chipped stones*, p. 26.

[3] For the full bibliography on the subject see Brown's catalogue, pp. 57—16. Also Logan, p. 29—31 and Panchanan Mitra, p. 138 ff.

scholars therefore place this find in the Eolithic period. At all events, the Bhutra find is, it is accepted, one of the few decisive pieces of evidence of the human existence co-eval with the presence of a vertebrate fauna long extinct and possibly pre-glacial or pre-pluvial.

Next in antiquity is the pre-Chellean Godaveri chip or flake[1] discovered by Mr. Wynne at Mungi near Paithan in Hyderabad, about 23 ft. below the base of the river-cliff. Bones of *elephas nomadicus* as well as remains of other animals show that they belonged to the same age as the remains of the Bhutra valley. For the same reasons, scholars differ from one another in regard to the attribution of the Mungi agate flake to the Eolithic or Palaeolithic ages.

To the above specimens Mr. Panchanan Mitra[2] would add some others recently discovered in Ceylon, Chota Nagpur, Cuddapah, the Andamans and Java, thereby showing that the pre-Chellean Eolithic culture was common to a large area of ancient Gondwana. He suggests that the Pithecanthropus type of men probably spread there with the late Sewalik and early Narbada (Pleistocene) fauna by land." He concludes that we might speak of "the earliest pre-Chellian culture here comprising of the Burma-Deccan-Ceylon-Andaman-Java area." Indeed, it seems to me, we may go further and say that, in as much as some of the animal finds at Bhutra have got affinities with the African and European, and some with the Malayan, the culture which the Bhutra find represents extended throughout the Gondwana continent and also spread into Europe. The geological conditions of the late Pliocene and early Pleistocene epochs were such as to favour such a diffusion. The existence of the Gondwana continent (which was to disappear into the Indian Ocean almost immediately after,) made the Eolithic sub-man an inhabitant of India, Africa and East Indies ; and the existence of a Eur-African continent at the same time facilitated his spread into Europe. The unity of Eolithic culture can perhaps be only explained by this hypothesis. It was this original unity of the Eolithic culture perhaps that explains the later Palaeolithic cultural unity ; for if the foundations were the same, the superstructure was bound to show, in the midst of the later variations, some affinity and resemblance.

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[1] In 1867 (J. A. S. B. pp. 144-5) H. F. Blanford wrote: "I am much disposed to believe that we have evidence in India of the existence of man at a much earlier period than Europe. We have here evidence of the co-existence of man with the animals the bones of which occur in the Godaveri gravels and which are identical with those found in the Narbuddah gravels. The fauna thus indicated differ much more widely from the existing Indian fauna than the Pleistocene animals of Europe do from those now existing in that country."

[2] *Pre-historic* India, (Earlier edn).

THE ETHNOGRAPHY OF THE EOLITHIC AGE

An extremely interesting question which arises at this stage is whether we can identify the earliest type or types of men who thus spread throughout the Austral continent and from there to Europe. We have no definite data on the point, and the question has always been, and is likely to be, one of speculation till definite and indisputably authoritative links which settle the question once for all are found. But from what we know—it is not much—of the conditions of the next or Palaeolithic age of history, we have reasons to believe that the earliest types of men to move must have been similar and allied to the 'Negritos' of the ethnologists. These people were probably hundreds of generations later than the Pithecanthropus and Sewalic types and much more human in form and in life. The Negritos were a very pigmy,[1] brachycephalic race, with very short stature, dark skin, frizzly black hair, flat nose and thick lips. They were, to use the language of Dr. Haddon, "an infantile undeveloped or primitive form of the type from which the African Negroes on the one hand and the Melanesians on the other with all their various modifications, may have sprung up." There is reason to believe, says the same scholar, "that mankind did not originate in Africa; but that all the main races in that continent reached it from Southern Asia. Implements of Palaeolithic type are found from Somaliland to the Atlantic, in the Congo State, and from the Zambesi valley to the Cape. We know nothing about the men who fashioned these implements, which are of very great antiquity; it is not improbable that we have here indications of a north and south divarication of Palaeolithic man *after he entered East Africa*." Haddon believes that the earliest races to come to Africa belonged to the Negroid stock—the Negroes, the Bushmen and the Negrilloes being their descendants. In the course of the glacial epoch, he points out, the Negroids must have entered Europe also, to judge from a few palaeolithic skulls of South France and Italy.

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[1] "In the Indian continent itself we have no evidence of a Negrito race but judging from its presence in the Andaman Islands and the Malay Peninsula, its existence at one time in the mainland of India may not have been impossible." (Mr. Birajasankar Guha, in *Modern Review* in November 1926, page 523). The Negrito Andamanese are like the average Japanese in the head-form but differ from them in having less height ; black and not yellow skin ; short and frizzly (not long or straight hair, and a much smaller brain capacity. Sir William Fowler regards the Andamanese as "probably the least modified descendants of the primitive members of the great branch of the human species characterised by their black skin and frizzly hair." Quoted by Haddon in his *Study of man* p. 73.

The Negrito movement extended not only towards the west but towards Oceania through the Malayan and Eastern Archipelago. "During the human period," says the same writer, "many if not all of the islands have been connected; for it is only in a few places that really deep water occurs, and there is reason to believe that the earlier immigrants walked across by land bridges." They occupied the Andamans, whose people are the best representatives of the race in the present day, the Philippines and New Guinea. The Semangs of the Malay peninsula, the Aetas of the Philippines and the pigmies of New Guinea are the remnants of this early migration. We cannot say whether the pigmy folk proceeded further. But Haddon believes that a taller variety of the Negritos may have given rise to the recenty-extinct Tasmanians, "who may have walked from New Guinea to Tasmania," to the Papuans proper and to the ground stock of the Melanesians. Whether there was further progress towards Polynesia and from there to America we cannot say in consequence of the absence of reliable data. The Antarctic continent had long ago vanished; and Polynesian drift, racial and cultural, must have been in the view of most, later.

More or less contemporaneous with the spread of the proto-Negroid specimen of humanity, there seems to have been in the earliest period of human history, the synchronous rise of the long-headed type which, wherever it had its origin (not improbably India), soon penetrated the mainland of Asia. In describing the possible movements of man, Haddon points out that in the pre-glacial age, this long-headed species probably occupied the fringes of the wide plateau which stretches across western and central Asia, and which divides the low lands of Siberia and the Aral-Caspian basin from the low lands of Mesopotamia, India, China and Manchuria. He points out that the low lands on both sides of this plateau, as well as the plateau itself, formed, in the glacial and post-glacial ages,the nursery ground of numerous dolico-cephalic and brachy-cephalic races which migrated to the different parts of the world and thus formed the substratum of the neolithic races. Now it is quite possible, he believes, that one undeveloped variety of the long-headed genus extended itself, even to the Mediterranean region to give rise later on, in the pre-glacial age, to the Mediterranean race. It is quite possible that it was this proto-Mediterranean race that was responsible for the dolico-cephaly of palaeolithic Europe and Africa. Indeed, history shows that the Hamite section of the Mediterranean race afterwards mingled with the African Negroes and gave rise to the Bantu-speaking and Hottentot peoples. It is quite possible that a movement similar to this took place in the pre-glaical age and contributed to the dolico-cephalic element which forms, in the midst of enormous differences, a common feature of the peoples of Asia, Europe and Africa. It is also possible that this long-headed veriety had, for its main and original branch, the progenitors of the pre-Dravidian and Indonesian peoples who had widespread habitat from South India to Australia and who swept away, excepting in stray areas, the brachy-cephalic Negritos who had preceded them. It might even be that this Indian dolico-cephalic type existed side by side with the Negrito and was the original type which gave rise to the Asiatic plateau type from which Haddon directly derives the later neolithic races of the world.[1]

An interesting question which will suggest itself at this stage is whether America formed a part of the Antarctic continent at the time of the appearance of man and, if so, whether he spread thither also as he did to Africa and Europe. One thing is regarded by many as certain, namely, that, as there is a complete absence of the anthropoid ape or any being like it throughout America, man could not have come into existence there. The American population must have therefore, it is believed, come from the old world. How they could have come is the next question. Dr. A. C. Haddon[2], points out there could have been in human times no land bridge between America and the old world across the Mid-Atlantic. Nor is there, he continues, reason to believe that the connection of S. America with the Antarctic continent persisted in human times. He therefore concludes that the only probable routes by which man went to America were either by the land connection of North America with North-west Europe or with North-east Asia. "We know that in late Tertiary times there was a land-bridge connecting North-west Europe with Greenland," a connection which persisted during glacial and post-glacial times. Similarly there was a broad land margin connecting North-east Asia with North-west America. Opinions are divided between scholars as to whether America was peopled by immigrants from Europe or Asia. In either case, man's movement into America took place after the glacial epoch. During the earliest periods of man's history, that is the eolithic age, the only parts occupied by him were South Asia, Africa, East Indies and Europe. Northern Europe, Northern Asia and America were to be inhabited only *after* the glacial epochs.

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[1] It may be mentioned that the scholars who do not distinguish the Dravidians from pre-Dravidians identify the Australians with them. This has naturally given rise to certain inaccuracies. Huxley, for example, dwells upon resemblances between them in their dark skin, hair and eyes, in their wavy black hair, their prognathous face and well-developed brow-ridges. The last two features are characteristic of the pre-Dravidians and not Dravidians.

[2] *Wanderings of Peoples*, page 54.

During the eolithic period, thus, we may conclude, the world was inhabited by groups of men (or sub-men) who were already differentiated from one another and who possessed very close resemblance in their modes of life and thought, though not in physical appearance. It was from these sub-groups as well as further migrations and mixtures of the glacial and palaeolithic epochs that the different stocks of modern humanity developed and reached stereotyped forms. The place of India in this series of developments seems to have been singularly important. She was the meeting place, apparently, of both the brachy-cephalic and dolico-cephalic varieties of the earliest men; of both of the proto-Negroids of Africa and East Asia, and of the dolico-cephalic races of Western Asia and the Mediterranean region on the one hand, and Indonesians and Australians on the other, the pre-Dravidians being the intermediate link between them.

BIBLIOGRAPHY

The authorities for Ch. I and II are referred to in the footnotes. To the above may be added the valuable introductions to Mr. Ananta-krishna Aiyar's *Cochin Castes and Tribes.* Vols. I and II, the *Imperial Gazetter* (Vol. I), and the introduction in Thurston and Rangachari's *Castes and Tribes.* Of all the numerous books on the general evolution of the world and man, Mr. H. G. Wells' *outline of History* is the most fascinating, and I have relied considerably upon it.

CHAPTER III

THE PALAEOLITHIC AGE

GENERAL CHARACTERISTICS OF THE PALAEOLITHIC AGE

Historians are agreed that the eolithic age of human history was followed by the palaeolithic or Old Stone Epoch, when man made implements of war and peace which were far superior to the eolithic ones, but still primitive enough to be styled *old* when compared with the later and better ones called neo-lithic. Further, from a series of ice deluges which swept over considerable portions of the continents of Europe, Asia and America and which revolutionised the physical configuration as well as the animal and plant life of the world, this age has also been called the Glacial or Deluvian age. The ice deluge extended, in its maximum progress, up to the 50th parallel, covering in Europe the area now forming Scandinavia, British Isles, the German Ocean and Russia, and in Asia the whole of the northern lowlands as well as a portion of the highlands to the south. The first of these glacial sweepings is believed to have lasted from about 550,000 to 500,000 years ago; and the second, third and fourth ones are believed to have taken place about 400,000, 150,000 and 50,000 years ago respectively. These deluvian and inter-deluvian periods have been collectively called 'early and middle palaeolithic.' Formerly, the palaeolithic age was broadly divided into the two ages of the River-drift-men and the Cave men; but the progress of science has enabled the whole age to be divided, for cultural purposes, into the successive epochs of pre-Chellean, Chellean, Acheullean and lastly Mousterian, each of which has been named after places in France where representative human remains of each age have been found. The latest part of the palaeolithic age is further believed to have lasted from about 35000 B. C. to about 10000 B. C., when the neolithic age began.

Throughout the half a million years and more that have been allotted to the palaeolithic period and its series of deluvian or inter-deluvian ages, man's implements underwent improvements in variety, make and efficiency. The beak-like rastro-carinate of the eolithic age, for example, gave place in the first deluvian age to better implements of the same type; in the second deluvian or chellean age to "celts" and "bouchers"; in the 3rd glacial and inter-glacial periods to the various "acheullean" implements in the form of scrapers, darts, throwing stones and axes, which are small in size, carefully modelled and adorned with small clippings indicative of growing skill; and in the last glacial and inter-glacial period, generally called "mousterian", when man had to live in caves and at the expense of several cold-loving animals, he improved the variety and skill of his implements. During the latest phases of the palaeolithic period subsequent to the ice-deluges, which have been assigned to from 40000 to 15000 years ago and which have been subdivided into the Aurignacian, Solutrian, Magdalinean and Azilian—all named after French sites where the remains of each age have been discovered,—man's industrial skill in making the implements went on improving. In the aurignacian period man did not only make more finished and variegated implements than those of the mousterian but new ones like the "heeled scrapers," and, what is still more interesting, has left the first articulate expression of a sense of religion in the form of statuettes and cave paintings and drawings about which a considerable literature has arisen. In the solutrian period man, besides producing the finest implements made by old stone men--some of them were the best ever made by man—like the thin blade of the laurel or bay-leaf pattern which was used as the head of a lance or dagger, engraved exquisite and life-like figures in bones and ivory, and further laid the foundations of a pastoral life characterised by the domestication of animals. The magdalinean man was an expert in pictorial art which he employed, in spite of his savagery, to practise his magic-faith and animism and also an expert in making implements in bone and ivory besides those of stone. The bone implements were a speciality and consisted of dart-heads, arrow-heads, spear-heads, barbed harpoons and needles, the fineness of which is a marvel. The last of the palaeolithic sub-ages, the azilian, was signalised by the manufacture of certain pebble markings which might be some kind of writing or denote values in a game. Historians are agreed that about 15 or 12 millenniums ago, the azilians were superseded by the neolithians, the immediate ancestors of modern races.

Not only was there a growing complexity, variety and skill in implements, throughout these ages, but there was an equal degree of complexity and variety in man himself. To the second inter-glacial period, for example, belonged the *Heidelbergus Homo* with a big body and large fore-limbs suited to use the " chellean " celts and bouchers ; to the third, has been assigned the *Eanthropus* (literally, dawn-man) of Pitt down in Sussex ; and to the last period of glacial deluge had been assigned the Neanderthaler (so called from Neanderthal on the Dussel, a tributary of the Rhine), the cave man, who discovered the use of fire, the art of living in family groups, the custom of wearing the skin-dress and the practice of the burial of the dead in a sitting posture with provisions for the life beyond death. Then came the *Homo Sapiens* or *Homo Recens*, the modern true man whose original home was, according to Dr. Haddon, probably the Central Asian plateau, and according to others, the southern fringe of the Mediterranean basin. Whatever might have been the original home, the *homo recens* soon spread himself over the different parts of the world ; and as a result of this, different varieties of men were evolved.

Several circumstances led to this. In the first place the growth of human skill in making implements enabled him to wrest lands and forests from their wild denizens

Secondly, climatic changes which came in the wake of the ice-sweepings and ice-recessions did not only revolutionise animal and plant life from time to time, but brought about important changes in the configurations of the seas and lands, necessitating and facilitating man's movements. In the earlier glacial epochs man had to contend against the mammoth,[1] the rhinoceros, the hippopotamus, the giant beaver, the bison, the wild cattle, the wild horse and the sabre-toothed tiger, all of which are now extinct. In the latest glacial epochs a number of animals which were suited to the cold and could take refuge in caves like the woolly mammoth, the musk ox, the reindeer, the lion, the bear, the hyæna were evolved. These were the enemies of the Neanderthaler man. In the later solutrian period man did not only become an expert in chasing these enemies but began a pastoral life, taming and domesticating many animals. Hundreds of thousands of bones of horses, reindeers, bisons, mammoths, etc. have been found in the solutrian remains. In the closing years of the magdalinean epoch the southern latitudes lost their arctic climate and therefore the arctic animals like the reindeer, the wild horse, the mammoth and the musk ox. The modern domesticated horse, the great ox, etc. came into existence. Many parts assumed their present geographical configurations. Great Britain, for example, became an island. The Mediterranean basin sank and cut off Africa from Europe.

The changes in climate, in animal and plant life and in geographical configurations facilitated the movement of the *homo recens*, as ethnologists point out, into new spheres and the rise of varieties among mankind. From the beginning, the modern man was in two types—dolico-cephalic (long-headed) and brachy-cephalic (broad-headed). Of these two types, the former seems to have been more numerous. From its original home or homes—for some believe that there might have been more than one—the dolico-cephalic stock spread itself to Europe where it was afterwards to develop into the proto-Nordic and proto-Mediterranean races; to Eurasia; to South Siberia, Trans-Baikalia, Turkistan and W. China, to give rise to the proto-Wasun, proto-Sacae and proto-Scythian stocks; to America to which they had an easy access as there were no Behring straits in those days; to Africa where they afterwards developed into the ancestors of the later Egyptians and Berbers and, further south, mixed with the Negroids and gave rise to the Bantu-speaking peoples and Nigrilloes. It is quite probable that the occupation of India and Indonesia by the dolico-cephalic stock was part of the general movement and it was as a result of this that the allied stocks of the Mundas, the Indonesians, and even the proto-Dravidians originated. The broad-headed type was less numerous but equally ancient. It has been called the Cro-magnard (from Cro-magnon in France) and probably gave rise to the later 'Alpine race'; and just at the time when the dolico-cephals were spreading themselves over Europe, Asia, Africa and America, the brachy-cephals spread themselves along the plateaus and uplands of South Europe and Western Asia from Britanny to the Hindu-kush sending stray emigrants further east as far as Bengal and Mysore. It is probable that the brachy-cephaly of Bengal, Bombay and N. Mysore was due to this extensive migration. It is probable that very early in this period a section of the brachy-cephals branched off to form the broad-faced, flat-nosed, oblique-eyed and scantily-haired Mongol variety as a result of local influences in Eastern Asia. In any case, by the beginning of the neolithic period the foundations were laid of the brachy-cephalic Alpine and Mongol races and the dolico-cephalic 'Mediterraneans', 'Nordics', 'Egyptains', 'Negirilloes', 'Bantus', 'Kols', 'Mundas', 'proto-Dravidians,' etc.

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[1] This word is derived from a Tartar or Russian word meaning the *earth*. The mammoth is an extinct species of the elephant which is derived from the southern type of it. The mammoth has left traces of its bones, teeth, skin, etc. intact in the frozen tundras of Siberia, in the alluvial gravels of England, N. Sea, Central Europe and N. America. It belonged to the post-tertiary or pleistocene age and to pre-glacial and glacial ages. Its face was much larger than that of the elephant as it had to support larger tusks. It had a coarse, dense, reddish and woolly coat which has been reproduced in the pre-historic drawings. Asiatic elephants show this woolly coat.

Such are the main features of the palaeolithic period as they have been ascertained from the numerous remains discovered in the different parts of the world—particularly Europe and America. We shall now pass on to see what the palaeolithic remains in India have to teach us. Unfortunately, these are not numerous or variegated enough to enable us to mark such clear divisions as those of the glacial and inter-glacial ages. Leaving the eolithic age aside for which the available data are still questions of controversy, we find that even the palaeolithic finds are not so numerous in India as to offer, comparatively speaking, a substantial enrichment in our knowledge of pre-historic man. This is due, in the first place, to the fact that the caves and river deposits in this country have not yet been systematically investigated. Some parts (*e. g.* Hyderabad) remain practically un-explored. Secondly, though the numerous castellated and abruptly rising rocks of the Dakkan could, and probably did, lend themselves easily to the stone men for shelters, yet they are, points out Bruce Foote, "extremely poor as compared with the parallel series of Europe, specially in France, Belgium and Switzerland." The caves and rock-shelters of the latter have safeguarded all kinds of human artifacts, but the Indian rocks and caves have failed to do so for reasons, climatic and other. Indeed palaeoliths have been found only in one cave in South India. It is not in *caves* but in the older alluvia of *rivers* or *lakes* and in the laterite formations of the coast, which belonged to the early pleistocene times, that Indian relics of the old stone age have been found. Even then no human artifacts have been discovered—except in two spots, one near Madras and the other in the alluvium of a small river in Guntur district. As no human remains are available, it is impossible for the historian to describe the palaeolithic Indian's physique. Nor have survivals of palaeolithic habitations been traced. Even bones of extinct animals are very rare. The stone age in India, for these reasons, is very obscure when compared with that of Europe. Not only is it impossible at present to divide it into distinct stages like the pre-chellean chellean, acheullean, mousterian, aurignacian, solutrian, magdalinean and azilian,—but it is equally difficult to estimate its comparative chronology. Still, the few materials that have been thus far found have gone to show sufficiently, though not satisfactorily, that the Indian palaeoliths indicate, as Bruce Foote has shown, the chellean, acheullean and mousterian epochs.

WAS THERE A GLACIAL AGE IN INDIA?

Naturally the first question which should suggest itself to the reader is whether there was a glacial age in India, and, if so, whether it can be traced as distinctly and minutely as in Europe. Different scholars have given different answers to this question. It has been maintained by some that the old river-terraces of cis-Himalaya, where the earliest traces of man and extinct animals have been found, show evident traces of glacial pressure.[1] Dr. Blanford of the Geological Survey goes further and argues that, on the ground that some of the Himalayan fossils are also seen in the mountains of South India and Burma, in the Narbada valley and the Karnul caves, all these areas must have been once subject to the same glacial deluge. Otherwise, it would not be easy, he says, to explain " how plants and animals of temperate Himalayan types succeeded in reaching the hills of Southern India and Ceylon as well as the forests of Burma and the Malay Peninsula." Dr. Blanford goes on : " When the whole country became warmer again, after the cold epoch has passed away, the oriental fauna appear to have poured into the Himalaya from eastward. Thus this theory will add to the evidence, now considerable, in favour of the glacial epoch having affected the whole world." On the other hand, Bruce Foote denies the existence of a glacial epoch in India. He suggests that, while the Himalayan and trans-Himalayan regions were subject to ice-sheath, cis-Himalayan India was subject only to pluvial pressure, to a series of tremendous showers. Throughout the pleistocene ice-age, he says, when the Himalayas and the mountains of the north were filled with glaciers, such tremendous rains must have fallen in the interior and "flowed off the land in vast floods, far exceeding ordinary rivers in column," and carrying away the shingles and palaeoliths from the Rajmahal and other regions in the interior towards the low country. "This vast discharge of fresh water into the sea of that period had doubtless the same effect on the marine fauna, but on a vastly larger scale, as excessively heavy south-west monsoons have been observed to have off the west coast of the Peninsula; namely that of killing immense numbers of sea-fish, on whom the influx of abnormal volumes of fresh water has a quasi-poisonous action. The strong currents set up by the long continued influx of rain-water, swept all the dead marine animals far away from the coast, so that they sank in deep water, there to remain fossils which will remain unknown and unseen, unless some vast geological upheaval were to take place and convert into dry land tracts of the sea-bottom now covered by deep water." This pluvial downpour, continues Bruce Foote, "had a similar effect on the west coast"; for we do not find there any *fossils* in the numerous diggings of the coast laterite from Travancore to Kanara. The talented scholar further observes that, in consequence of the fewness of caverns and rock-shelters in South India, "man must have had a very bad time during the continuation of the Pluvial period and very probably died out very largely or altogether. The land fauna of the Pluvial period must also have suffered very greatly, especially such members of it as habitually resorted to underground habitations, in which they would be constantly liable to be drowned."

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[1] See **Wadia's** Geology, p. 15—16 He points out how many of the lower Himalayan parts not supporting any glaciers at present, the hills of the Punjab and even the peninsular highland show traces of a glacial age in the pleistocene period.

PALAEOLITHIC SITES IN SOUTH INDIA

Perhaps the most remarkable feature in the Indian palaeolithic finds is that the vast majority of them are made in a peculiar kind of rock called *quartzite*. The palaeolithic people seem to have deliberately moved in search of this rock or a similarly suitable variety. We find such rocks more commonly in South India than in the north, more in the east than in the west[1]. Another striking feature is that the palaeolithic men seem to have avoided forest regions; probably on account of the great difficulty they must have had in clearing them (forests must have been much more extensive then than now) with their primitive weapons. A review of the sites enumerated by Bruce Foote and Coggin Brown illustrate these features clearly. Starting from the southern extremity of the Peninsula, we do not find any old stone remnants either in Ceylon or Travancore. This was due to the absence of quartzite and to the abundance of forests in these regions. No palaeoliths have been found in Tinnevelly for the reason that there is no quartzite there. It is in Madura that the explorer, proceeding northward from the Cape, first meets with the remains of Palaeolithic men. Bruce Foote notes two specimens got near Madura. Passing on to Tanjore, two palaeoliths (of chert) have been discovered near Vallam. These are so primitive in workmanship that it has been thought that they might be (though probably they were not) the remnants of the eolithic age. The district of Trichinopoly has contributed two oval implements discovered about 45 miles to the east of that city. Salem, which is rich in neoliths and early iron age finds, has not brought to light a single palaeolith. Malabar and South Kanara which abound in trap rock for which palaeolithic men seem to have had an aversion are equally meagre. Mysore State on the contrary is comparatively rich. Palaeoliths made of quartzite and very rude in shape, have been discovered in Kadur, Nyamti (16 miles north of Shimoga), Talya (Holakere Taluk), and two other places. In the last of these the kind of rock called *quartz* is more abundant; and yet the palaeolithic men chose the rarer quartzite on account of the fact that the latter lent itself more easily to work. Bellary district has given pre-historic materials in as many as 77 localities. One peculiarity in these is that the implements are not made in the true quartzite (which is not available in this district) but "a sileceous variety of the haematite quartzite" which belongs to the Dharwar system of rock formation (which is older than even 'the Cuddapahs'.) The Bellary rock "lent itself by no means so well to being worked into implements as the true quartzite, but still the old workers managed to turn out useful axe-heads and other tools." The Bellary implements have been found along the foot of the Cooper Hill, south of Bellary, and a number of villages. Cooper Hill was apparently a seat of the palaeolithic people, the implements made by them having been brought down by the local rains and buried in the soils beneath. Anantapur is very poor in palaeoliths, though not in neoliths. In the District of Cuddapah, the central part of the Rayachoti Taluk and its vicinity have furnished as many as 220 specimens, some of which are Rostrocarinates and most of which belong to the mousterian stage of palaeolithic culture. "The early palaeolithic man in India" says Mr. Panchanan Mitra,[1] "made Cuddapah the centre of his culture as this district is practically the home of the quartzite formation, and thus had the best attractions for the primitive settlers. Any rough and handy form suitable for throwing and cutting a wound if possible, was sufficient for these peoples. Sharpness of the edges is met with in some artifacts which made them quite effective, and rude efforts at selections of pieces affording grooves as facilities for holding these tight are discernible. Some sort of chipping, however rude, can always be traced and bespeak probably the work of rude, thick and stout fingers.

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[1] For details of the localities in each district see Bruce Foote's *Rais. Catal.* (1914); his *Notes on their ages and Distribution* (1916); and J.C. Brown's *Rais. Catal.* (1917). The last work gives all the bibliographical details in regard to each find. Both Bruce Foote's *Notes* and Brown's catalogue give plates illustrative of the finds.

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[1] See his *Pre-historic India*, App. II, 256, ff. where 11 examples of Rostrocarinate types,—the only available ones out of 4,000 to 5,000 palaeoliths, discovered in India—are described among the Cuddapah finds. "The formation, known geographically as the Cuddapah series", says Logan, "is important not only as the boundary of the coast system in its northern half, but also as the source of the quartzites from which the palæolithic implements of Southern India were usually fashioned" (*Chipped Stones of India* p. 8 and also p. 26). "It would seem that Cuddapah was an important centre in palaeolithic times, as Bellary subsequently was for the neolithic men."

Cutting woods and piercing animals were also occasionally done with these same artifacts, which were not yet developed into distinct types; but it is doubtful whether any digging could be carried on with them." To a distinctly later and more settled palaeolithic life, belong the finds made in the alluvial neighbourhood of Madras, namely, North Arcot, Chingleput and Nellore[1]. These have, in fact, been called the classical land of the palaeoliths. It was at Pallavaram that Bruce Foote made his first discovery in 1864, inaugurating the study of the science in India. The chipped stones found here evince a distinct development in the artistic instinct of the primitive man. They show a deliberate choice "of colours and a distinct progress in craftsmanship. They show how humanity was flourishing in those portions of South India under conditions highly favourable to primitive life. The proximity of rivers to the rocks highly suitable for the old weapons and implements no doubt was helping man much to be the dreaded hunter of animal life." The districts of Guntur, Godaveri and Krishna have afforded some palaeographic materials, but not as many as can be expected. The Godaveri district was well within the sphere of palaeolithic men and we have got palaeoliths in the gravels of the river higher up, but further down no palaeoliths have been found. Evidently the land surface occupied by the old stone age peoples has been covered by the river alluvia. Some of the implements[2] made in the upper Godaveri region (*e.g.* those discovered by Dr. Blanford west of Bhadrachalam), are not made in quartzite but in white vein quartz. It has been already mentioned how Wynne's discovery of the flake knife at Mungi (near Paithan) throws, according to some, light on the palaeolithic period and, according to others, on an earlier epoch of human activity.

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[1] See Logan, p. 13—6 for the history of this part of the coast.

[2] Brown compares these implements, which generally vary from three inches to six in length, with those discovered in English and French gravels and shows how, from the presence of many ill-formed implements and abundance of flakes chipped from the quartzite, we must infer that it was a place of great activity.

Passing on to the Karnul District the local finds are interesting as the only examples of cave finds in South India as distinct from river-drift finds. These Karnul palaeoliths are found at the Billisangam hill-caves discovered by Captain Newbold in 1844. They contain traces of human habitation as well as extinct animals. As pottery have been discovered in the high fossils of these caves it has been suggested that they were continuously tenanted down to the neolithic times. The palaeolithic remains of these caves have been assigned by some to the magdalinean[1] epoch, but by others,[2] on the basis of the extinct fauna of the caves, to an earlier period. It is believed that the palaeolithic men were driven into these caves either during the glacial or the pluvial age. It has been suggested by Lydekker that some of the African and western mammals (like the hyæna, the equus, etc.) were derived from India of this period; "The most remarkable feature in the list" of the Karnul fauna, he says, "is the occurrence, among a number of existing Indian species, of a cyno-cephalus,, of *Hyœna Crocuta*, of a small equus, indistinguishable from *Equus asinus*, and of a *manis* apparently identical with the existing West-African *Manis gigantea*; while scarcely also less noteworthy is the occurrence of a peculiar species of rhinoceros and of a hystrix and a viverra specifically distinct from the species now living in India as well as the non-Indian genus *atherura*. The occurrence of the genus cynocephalus and of forms identical with the african species of hyæna, equus and manis is extremely important in supplementing the evidence afforded by the Siwalic fauna as to the probable derivation of many of the existing Ethiopian mammals from those of later tertiaries of India; and it is interesting to trace the gradual dying out in the latter country of genera and species which are now dominant forms in Africa." It is difficult to say whether the cave age in India was exactly synchronous with that in Europe; It might or might not have been. Both at all events must have been due to the same circumstances or climatic conditions. It may be added here that there are many caves in the Vindhyas which yet await systematic exploration.

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[1] Eg. Bruce Foote.

[2] Eg. Lydekker. "The comparatively large number of species totally extinct or which are not found living in India renders it probable that the age of a considerable part of the Karnul cave deposits is not newer than the pleistocene, and the fauna as being almost certainly more recent than that of the Nerbudda beds may be provisionally assigned to the later part of that period." Altogether 2000 bones have been discovered, and they show that there were then the primate Semnopithecus; the Africo-Siwalic species of cynocephalus; several species of the cat family found in the present day; the hyæna; the viverra (which is also found in eocene England); two species of equus (which are seen in Africa, thus indicating that the African races originally came from India); a species of rhinoceros different from the existing ones but resembling *R. Etruscus*; several kinds of ox, and antelope; and numerous other types, besides 7 species of birds, 5 of reptiles, 1 of amphibia and 4 of mollusca. Almost all these animals belong to the pleistocene age at the latest.

PALAEOLITHIC CENTRES IN THE DAKKAN

Palaeolithic remains have also been discovered in Hyderabad; in the districts of Dharwar, Bijapur and Belgaum in the Bombay Presidency; a few localities in N. E. Gujerat; and in Rewah and Bundelkhand. The Hyderabad find at Yeddhahalli[1] is made in an unusual material—hard sileceous limestone of grey colour—and was apparently used on account of the absence of quartzite in the immediate vicinity. The Bombay remains,[2] which have been found on the alluvia of the Bennihalli and the Malprabha rivers, indicate the existence of large palaeolithic settlements in the quartzite ridge immediately to the north. To the northward of this ridge,[3] says Bruce Foote, "are

[1] See his *Notes* p. 122. All the Hyderabad and Godaveri valley finds are exhaustively described by J. C. Brown in his *Rais. Catal.*, p. 60—62. The chief localities are Maladi, near Sironcha; a number of places in Sirpur Taluk, Adilahad division; Chinnur in the same division, Chanda district; and the Penganga or Wardha valleys in Berar. Brown gives a list of 45 things. See Also Logan, pp. 26—8.

[2] Almost all the palaeoliths of the S. Mahratta country, originally collected by Bruce Foote, are now in the Calcutta Museum. They are described by Mr. J. C. Brown in his *Rais Catal.*, pp. 47—57, with sufficient bibliographical details. The chief places are; the vicinity of Hire and Chik Mulingi (20 miles above Kaira); Tolamatti near Kaladgi; Tolur 8 miles off; Manoli Arukeri; etc., Brown's list includes 608 things.

[3] See Bruce Foote's *Notes*, p. 131.

indications of the existence of a lake or swamp, which I will call the Badami " lake, which gave rise to the quasi-lateral deposits in which the palaeoliths were buried and from which they were subsequently washed out by atmospheric agencies and carried down into the younger alluvia of the rivers Malprabha and Bennihalla." It must be observed here that the forest country north of Dharwar, in the crest of the Ghats, is singularly bereft of old-stone finds,[1] probably for the reason that the dense forests could not be penetrated by the stone-workers. It is in the eastern slopes that the Palaeoliths are found. The northern half of Bombay Presidency has not been properly investigated; but it has been doubted whether any palaeolithic people could have lived there; for the rock which they loved to work upon is singularly absent in that area. In Gujerat, the people were within the reach of such a rock; but few examples of implements are available from that region. " Those met with came from the northern[2] part of the country and had been brought down from a still more northerly region by the flood waters of the river Sabarmati at an immensely remote period and buried low down in its old alluvium." Bruce Foote mentions nearly half a dozen of them. All of them are worked in quartzite of different degrees of fineness, and consist of flakes or axes of the southern type. Kathiawar is rich only in neolithic remains. Rajputana[3] has produced about 10 palaeolithic examples,—from Jaipur,

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[1] As Logan says, the Southern Mahratta Country where the gneiss of Madras meets the trap of Bombay contains palaeoliths only up to the boundary, not beyond it, as it is only there that laterite has been formed under fresh-water conditions of sedimentary accumulation. See *Old Chipped Stones*, pp. 21-23. Logan objects to Bruce Foote's calling the weapons discovered in the Malprabha region on the ground that they are not true palaeoliths; but Bruce Foote disagrees with him in his *Notes*.

[2] See his *Notes*, p. 135. They have been discovered near Sadolia in the Sabarmati (Parantij Taluk) and Padhamli (Vijapur Taluk), 15 miles higher up the river than the above. Two of these are illustrated as 3248 in Plate I and 3309 in Plate II of his *Notes*.

[3] The palaeoliths of Rajputana were discovered by C. A. Hackett of the Geological Survey probably in the seventies of the 19th century and are now in Indian Museum. Of the ten three are missing They are given in Brown's *Rais Catal.* p. 66-67. Brown calls all of them *bouchers* and illustrates them in Plate V of his book (figures 3, 6 and 7.)

Bundi and Indargarh.—made in quartzite of grey, bluish and whitish-and reddish brown colours. Palæoliths were found in the Rewah State[1] by Richard Dixon Oldham in 1893, and in the Districts of Saugor, Damoli and Bundelkhand by W. H. Wilson in 1866. The Rewah finds are of special interest in that they are not made of quartzite but of porcellanite, an equally suitable material, which occurs in the lower Vindhyan rocks. "The very great amount of weathering the implements have suffered is a strong proof of their great antiquity and the great changes the stone has undergone is clearly shown in some of the accidental chips that have befallen them, the unaltered stone being quite dark, almost black in colour, while the weathering of older breakage shows in shades of grey of greater paleness according to their age." The gravels of the Narbada valley have revealed some palaeoliths as well as mammalian remains, which give a clue to the environments in which the old stone age men worked. Old stone implements have rarely been found in Bengal, Behar and Orissa.[2] The Calcutta Museum possesses only three specimens from there. One of them is interesting for the fact that it is the one discovered in the eastern-most locality in India, none having been found for hundreds of miles in the Gangetic alluvium to the west. Four old stone specimens have been discovered in Orissa. All these are in quartzite similar to that of Madras and Central Provinces; and it has been inferred by Brown, from the similarity of forms and materials, that a connection must have existed between the palaeolithic peoples of the different parts of the country and that the necessary means of transport must therefore have existed. No palaeoliths have been found in Assam, Burma and the Himalayan regions. The Punjab has given only a few flakes and cores of the neolithic period.

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[1] The remains of the Central Provinces and Central India are now in the Calcutta Museum, and enumerated in Brown's *Catal.* p. 62-66. He gives 125 of them. Among the chief villages are Moer, south of Deori in the Saugor district. Nourdhana in the same district; Singrampur between Jubbalpur and Damoh in Damoh district; the Kalloomer hill, etc. See figures 5,7,8,10,11,12 in Plate IV of his work.

[2] See Brown's *Raise Catal.* p. 67-68. Two of the Bengal finds were discovered by Ball in 1865 and 1867 at Kunkune and Jeriah coalfields and a third by Hughes in Bokharo coalfield about the same time. The Orissa finds were discovered by Ball in the villages of Denkanel, Angul, Talchir, and Sambalpur. They are illustrated in Plate VB of Brown's *catalogue*. For the Jeriah finds see *Ibid* plate V. Fig. 2. See Logan, p. 32-3.

THE PALAEOLITHIC CULTURE

The finds above described show that the old stone-age culture in India was very similar to that of Europe and the rest of the world. Here, as elsewhere, the stone-age man was a savage who sought shelter in the drifts of rivers or lakes and caves who lived not only on the roots, fruits, nuts afforded by nature but on the game acquired in the chase, and who had implements for smiting, cleaving, digging and other purposes of peace and war, chipped in rock fragments. The Indian implements have been classified by Bruce Foote[1] into ten distinct forms—axes, arrow-heads, spears, digging tools, circular hurling-stones, choppers, knives, scrapers, cores, hammer-stones and (probably) strike-a-lights. These were chipped, mostly, as has been already said, in the rough flint called quartzite and, in places where quartzite was not available, in other kinds of rock like jaspery haematite, quartz and porcellanite. The Indian palaeoliths are characterised by variety, efficiency and shapeliness. They are more numerous and better-shaped than similar finds in Australia, at all events. The axes, for example, are in 4 varieties—pointed-oval, oval, square-edged and oblique-edged. The spears are of two types, narrow as well as broad-based. The digging tools have thick pebble butts, The circular implements which were used as hurling stones have sharp edges all round. The choppers are pointedly oval with sharp edge on one side only, while the knives are in the form of long, narrow flakes with parallel sharp sides. The spear-heads, when fitted with suitable shafts, would have been very formidable thrusting or stabbing weapons. All these indicate a rough and primitive workmanship. The Indian palaeolithic men were as elsewhere, ignorant of the art of grinding, grooving and polishing. They made the tools not by making a number of small chippings but by the simple process of striking sharply and strongly with another piece of stone. They did not know how to provide handles for them, and had to hold them in cleft poles securely lashed with gut or strips of hide or vegetable fibre. The hollow bamboo pole which is so plentiful in the land would have, with its socket, provided an excellent handle. In addition to sharp-edged instruments which were dangerous for the unguarded hand and which could be used only with handles, there were instruments with thick butt ends, which the palaeolithians probably used for digging up edible roots or for hand-to-hand combats.

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[1] Mr. Coggin Brown would divide all these into 3 classes, namely (1) bouchers, corresponding to the English Celt (2) palaeoliths (including the axe) and (3) discoid forms. The axe, he points out, is of 2 kinds, namely square-edged or Madras type and obliquc-edged or guillotine type. Logan denies the existence of the axes and spear-heads among Indian palaeolithic implements and believes that there were only heavy choppers and pointed ovals, both used without any hafting to wood. Bruce Foote entirely disagrees with this view. "I am distinctly of opinion that many of the palaeoliths could not have been used for any purposes unless hafted; for they were made much too sharp-edged to have been used in the unprotected hand. and the palaeolithic people, savages though they may have been, were assuredly intelligent enough to invent for their axes and chopper's handles and shafts for their sharp-pointed implements to convert them into spears, The mere use of clubs must have taught them the advantages of having a long swing to their most formidable and therefore most valuable weapons, and very experience must have shown them that the great gain of being able to avoid close hand-to-hand contests with their human enemies and much more so with the huge wild beasts they had to encounter from time to time." (*Notes*, p. 132) Elsewhere he says :—" A bamboo pole of suitable size having been procured, it was easy to cut the head end off some 3 or 3½ inches above one of the joints, which would make a very good socket for the implement to be inserted and wedged in quite tight with wooden wedges and then to tie a strong lashing round the base of the qnartzite head to secure it still further." (Ibid, p. 173). He also gives an illustration of the method of hafting. Where bamboo was not available, other kinds of wood would have furnished suitable shafts.

Over and above the stone implements, the palaeolithic men used wooden ones. Inhabited as India was then with many beasts of size and ferocity which were formidable competitors with man for mastery over the land, it must have been impossible for the palaeolithic men to get on with mere stone implements, however well and securely mounted and hafted they might have been. They must therefore have constructed very effective weapons out of the hard durable woods which grew plentifully in many of the forests. " These exceedingly hard woods could be worked into spears with extremely sharp points and of sufficient size to be very formidable weapons of offence, if wielded by strong and active men, and especially so if a number were armed and acted in concert. Clubs too of the largest size could easily have been prepared by uprooting young trees of many kinds and trimming away the tops and their roots." Such a wooden spear was actually used by one of the skin-clad, long-haired, long-nailed, barbarian tribes who, centuries later, opposed Alexander the Great, in North-west India; and Sir Thomas Holdich came into contact with one in the woods of Western India. But no wooden artifacts have been discovered as yet, for the very good reason that they must have been destroyed by white ants. A solitary wooden comb which has escaped these little destructive agents thanks to its being imbedded in ash (which is very incongenial to their soft and moist body), has been discovered at Guntakal. The palaeolithic men were probably not ignorant of fire; for traces of its use have been found in the Karnul caves. It is very probable that as a result of observing the rise of fire from the frictions of trees, they discovered the art of preparing it artificially by the friction of combustible pieces of wood like the later Vedic *arani*. As the palaeolithians had scrapers among their implements, they must have had, in addition to the natural coverings like leaves and barks, garments of skin. Probably they had no sense of religion and at least in the earlier periods left their dead to natural decomposition or to be devoured by beasts—a system *not dead* in later historic times.

THE ENEMIES OF THE PALAEOLITHIC MEN

In a very interesting note Bruce Foote describes the extremely hard geological environments in which the palaeolithic men lived. Indian fossils of the age indicate not only the appearance of several of the modern species of animals but the extinction of many old ones. The

Indian stone men in fact had more enemies to contend with than those of the west. Bruce Foote enumerates among his ferocious enemies the tiger, the lion, the panther or leopard, the fishing cat, wolf, jackal, wild dogs, hyæna, black bear, the elephant, rhinoceros, the wild buffalo, the python and viper on land; the crocodile in rivers; the several kinds of poisonous fish in the sea; and formidable swarms of insects like bees, wasps and hornets and the guinea-worm among the smaller enemies. Even the capture of harmless animals like the deer, antelope and gazelle which were useful for food, required skill as well as agility on the part of the primitive hunters. "The above list of man's tropical enemies proves abundantly that early man in India was exposed to many more dangers than was early man in Britain or Western Europe, in palaeolithic or neolithic times." The dwellers of the Karnul caves must have been, Mr. Panchanan Mitra points out, mighty hunters. "At least 200 bone weapons or implements were found there. They include all manner of primitive weapons required to destroy the wild denizens of the forest and to cut them up for food. Awls, many kinds or arrow-heads, small daggers, scrapers, chisels, gouge, wedges, axe-heads, etc., form part of the various kinds of things which bear definite traces of being worked up by man. The flesh probably was selected from any animal that came ready to hand and might have been smoked before being taken as the presence of the cinder plainly brings out the existence of fire. There can be little doubt that the majority of the animals whose bones have been found, formed the diet of these primitive inhabitants. The horses, gazelle, the antelope, the bovine species, the rhinoceros, and the manis supported quite a heavy meal though it must have been but few and far between. The lion, the leopard, the tiger, the hyæna, the bear, the big monkeys, were creatures with whom they had to deal in the course of their forest excursions and they went to bulge their game bag. These primitive dwellers did not lack any muscular strength at all as some of their bone weapons show."

LATER PALAEOLITHIC PROGRESS

The development of cultural progress in the later periods of the palaeolithic age, that is, in the ages which form the solutrian, magdalinean and azilian epochs of pre-historic Europe, is clearly indicated by the finds in Bundelkhand,[1] Cuddapah, Karnul, Bennihalla, Arattambakkam, Banda, the Kaimur ranges and elsewhere. They indicate not only the extinction of many of the older animals but the appearance of several modern species of the monkey, the tiger, the domestic ox, the horse, the camel, the giraffe, the buffalo, the crocodile, etc. They also show how the mind of the Indian man developed, as in Europe, a wide use and variety of weapons and implements as well as deliberate geometrical forms and distinct attention to colour. They show a real and substantial advance in the processes of chipping, pecking and sharpening, as the result of which many new and curious forms—convex faces, ovoids, triangular and rectangular pieces, round and ridged types—which form a rich and agreeable variety and which give a clue to the growing vigour of the primitive man's thought and skill, came into existence. The edges of many of these later palaeolithic implements show, in particular, the multiplicity of conceptions. Some of these edges are elongated, some oval, some truncated, some sharp, some crescent-like, some oblique, and some wedge-shaped. The sides, again, are sometimes convex, sometimes parallel, sometimes concave. Many are pebble-butted, showing new industrial or combative uses. As regards colours, we find a growingly deliberate choice of the striped red, the mottled grey and the white band, in the original materials. In fact, as time progressed, there was a gradual approximation to the subsequent neolithic age, so that, at a particular period, there was a tendency for the two ages to overlap each other. Mr. Panchanan Mitra points out how a few of the artifacts found in Chingleput, at Chakradarpur, the northern and eastern outskirts of the Vindhyas, and in Central India—even two yellow palaeoliths at Trichinopoly—have already ushered in the era of neolithic forms, processes and materials of workmanship. The change from quartzite to trap and chert, the materials of the neolithic period, is already a fact. The old, irregular, oblique-shaped and pointed oval axe types give place to square-edged, regular-shaped forms, which require prolonged skill in workmanship. Beautiful trap-flakes, crescent-like scrapers, tapering pieces, show the advent of smoothening and polishing. Two shapes peculiar to India, the oblong and triangular choppers, have already come into existence.

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[1] The Calcutta Museum, writes Logan, "contains a number of stones of shapes graduating from palaeolithic to something like neolithic from various localities in North India. Such are stones of a material resembling quartzite from Neemuch in Central India, from Jaipur, Rintambur, Bundi and other places in Rajputana and from Bundelkhand; while from Marpha in the Banda district of the United Provinces, there is a large collection of implements of trap. There are also trap stones from Damoh."

WAS THERE A PALAEOLITHIC RELIGION?

An extremely interesting question in comparative prehistory is whether there was, in palaeolithic India, that germ of the religious sense which existed in the aurignacian and subsequent epochs in Europe, and which, among other things, gave the incentive to the remarkable cave paintings we have already studied. The latest authorities on the subject seem to be agreed that there was such a development in India. It has been suggested that the Karnul caves were associated with certain religious rites and that they were resorted to by a race who were hunters of the scalps of men as well as of animals; for not a single skull has been found among the bones discovered there. ' With the exception of two or three tolerably perfect skulls of bats which lived in the cave, no entire crania or large fragments of crania were found." The presence of cinder in the caves, the absence of skulls and the fact that the human bone is apparently smashed have given rise to the theory that the cave men must have had some kind of magical, religious rites [1] in which human sacrifices to a pristine cave deity (as among the later Meriahs) played a prominent part. Mr. Panchanan Mitra suggests that the caves were probably deserted for a time immediately after death; for the palaeolithic age was too primitive to erect tombs of any sort, and the bones were simply exposed in the caves, thus making the stay of the people there for some time untenable. If this were the case the Indian palaeolithians must have had a less religious sense than those of Europe; for we know that even in the age of the Neanderthaler, that is, before the glacial age ended, there prevailed the system of burial of the dead in a sitting posture with the deposit of provisions in the grave for the departed spirit. From the fact that the custom has been very common among some Indian communities even in historical times, we may perhaps guess that palaeolithic India did not differ from palaeolithic Europe in this respect and that remains demonstrating it may some day come to light under the spade of the Archæologist. At present there are no palaeolithic graves available.

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[1] Mr. P. T. Srinivasa Aiyangar suggests that the sacrifice to guardian spirits, the matriarchal system of social organisation, human sacrifices,

An interesting question which must be discussed at this stage is whether the palaeolithic Indians had that remarkable proficiency in the art of drawing and painting which characterised the aurignacian and his successors in Spain, France and elsewhere in Europe. The palaeolithian paintings in the West have been generally found in dark, narrow, inaccessible graves and grottoes, most of them drawn in a kneeling posture with the aid of lamps of fat. They are believed to indicate the earliest articulation of man's religious spirit and give a clue to that crude, animistic magic-faith which is found among primitive races and which is clearly associated with totemism and ancestral worship. They are believed to show the early man's crude doctrine of universal vitality. Early man believed that everything moving was inspired by an inner spirit. If the spear destroyed a beast, it was because it had a destructive energy in

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buffalo sacrifices, offerings of spirits, indecent orgies, etc. can be traced to the old stone time. It is doubtful however whether they can be traced to the palaeolithic period except in the more rudimental forms. Some of them at least were neolithic developments.

it. Each wonder-working thing had a wonder-working spirit behind it. Now some of the spirits were good and some bad. The primitive man's idea was to get the help of the good and prevent the malignancy of the bad. One way in which he believed he could do this was by drawing portraits of the originals and controlling the latter through the former, a system which has always been the basis of magic. The dislike which the early savage felt for some animals, for instance, made him feel that if he drew their figures he would obtain a magical power over them. Human hands with mutilated fingers, animals with pierced dart taking refuge under rocks and desperately standing in their haunches among lively and masked dancers, the employment of red ochre or black manganese, the stencilling of the hands on the wall, the use of cups cut in the skulls, burial in crouched posture—all these, it is believed, can be traced to the influence of magic-faith. The magical rites were either negative or positive. The most important of the latter type centred round things like the multiplication of food animals and food plants through prayer, sacrifice and communion. The aurignacian paintings in Europe are believed to illustrate all this. They depict the bisons, cows, mares, deer, boars, etc. as they figured in the chase. The human figures are invariably masked giving half-animal and half-human appearance. The drawings include what was *seen* as well as what was *thought*. The dots and lines belonged to some picture-writing, the interpretation of which, however, has baffled scholarly skill. From the way in which the clubs or weapons are represented, from the presence of a single dot amidst a circle of dots and from the portraiture of a wounded bison on its haunches near the circle of dots, Mr. Marrett, for example, would read the riddle as a charm running thus: " With these weapons and by these encircling tactics, may we slay a fat bison, O ye powers of the dark !" Such portraits and drawings are naturally true pictures of society. The women dancers, for instance, are not masked but wear high hats and bell shaped skirts.

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*See his *Anthropology* (Home University Library series), chapter VIII.

Now, were there such 'primitive cathedrals' and 'picture galleries' in palaeolithic India? Bruce Foote denies their existence in India, probably for the reason that he did not meet with them in the Karnul caves. But a remarkable set of such paintings were discovered in 1910 by Mr. Anderson of the E. Indian Railway in some caverns at Singanpur near Raigarh in the State of that name in the Central Provinces. The caves were probably on the road from the north of India to the south, and proved convenient stations for moving palaeolithian settlements. The figures were apparently drawn with bamboo brushes. They are, as in Europe found in difficult and inaccessible places. The figures are in red pigments of two kinds, some of which unfortunately have been washed away for ever. The available ones reveal some very interesting features. Mr. Percy Brown, Principal of the Calcutta School of Arts, divides the subjects of these paintings into four kinds, namely, (1) hunting scenes, (2) groups of figures, (3) picture-writing or hieroglyphics and (4) drawings of animals, like the reptiles, etc. One of the hunting scenes represents a spirited encounter with a bison, bull or an elephant. The hunters have got spears in their hands and masks in their faces. One individual is graphically represented as he is tossed above. Another beautiful scene depicts a man being hugged by a bear, while another tries to rescue him by attacking the beast from behind. As regards the human figures, they are all in a dancing posture, which has made some scholars believe that that they should have engaged in some religious ceremony. Some are cross-legged; almost all have their arms up-raised. The picture-writing is chiefly in the form of zigzag lines (generally identified in Egyptian hieroglyphics with water). Mr. Brown, in fact, suggests that one piece probably represents a waterfall four miles off the site of the paintings. Another set apparently depicts a setting or rising sun. Animals

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[1] For his description see Panchanan Mitra's *Pre-historic India* (1924 edn.) app. I, pp. 245-255. Mr. Mitra's own observations are on pp. 143-47. The latter draws attention to certain features un-noticed by the former or Mr. Anderson. All the paintings of Singanpur are reproduced in Mitra's book, and form a remarkable group.

like the lizard and the sambar are drawn in a most natural and spirited fashion. There is the figure of a kangaroo showing, as Mr. Panchanan Mitra points out, a cultural touch with Australia in this age. As the paintings are said to show in technique some resemblance to those in Egyptian pottery, we have to infer cultural connection with the West too. The Indian set is, in the opinion of Mr. Brown, not of that high artistic quality which characterises the prehistoric cave paintings of France and Spain. "But as already indicated," says the same scholar, "some of the drawings show the same method of brush-work as the more primitive paintings at Cogul in Spain. The chief artistic feature of the Raigarh paintings lies in their spirited expression and spontaneity of treatment. A strong family likeness may be noticed between these cave paintings and the patterns on what is called the cross-line pottery of Egypt. In these the men are represented in the 'triangular' style, a method adopted by many primitive races of ancient and modern times." Other examples of palaeolithic art in India are afforded by certain cave paintings in the Kaimur ranges and elsewhere discovered by Cockburn[1]. They belong to late palaeolithic or azilian times, though the discoverer himself attributed them to the middle ages. They contain spirited and life-like portraiture of hunting scenes, very much in the model of the Singanpur caves.

Mr. Dikshit of the Archæological Department showed to Mr. Panchanan Mitra[2] several photos from various places in Mirzapur district, of rock paintings in red haematite, configuring hunting scenes where elephants and horses were objects of chase. It is very probable that, as Mr. Mitra observes, "the Vindhyas, when thoroughly explored, would prove to be a classic ground of primitive if not pre-historic art" as in the Pyrennees.

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[1] Cockburn gave an interesting, description of his discoveries in J.A.S.B., 1883, and J.R.A.S., 1889. The paintings are in the Ghormangar cave, Chunadri cave, Lorri cave, Likhunia rock, etc. One of the painted scenes is the chase of a horned stag with spear. Another represents a man with two harpoons (not torches as Vincent Smith thought), pursuing a leopard, in the company of another similarly armed. A third scene represents a rhinoceros hunt by six men, which is exactly like that at Singanpur. Cockburn also describes a boar-hunt scene at Roup in Burhur Pergana, another rhinoceros hunt in the Harin Harna cave near Bidjeygarh and the spearing of a sambar in Likhunia rock-shelter. Similar but cruder drawings from the Banda district are referred to in J.A.S.B., 1907 p. 467 ff.

[2] See his *Pre-historic India*.

THE END OF THE PALAEOLITHIC ERA

From the comparative levels of the soil deposits in which the palaeolithic and neolithic materials have been found, the older scholars inferred that there was a gap of many thousands of years between the two ages; but the new school believe that the advent of the neolithic period can be gradually traced, as has been already pointed out, from the earlier palaeolithic epochs through the successive stages of aurignasian, solutrian, magdalinean and azilian epochs. Bruce Foote[1] suggested, from the ancient finds on the Sabarmati river (Gujerat), that there must have been a big gap between the two periods in India, though he regarded the exact duration of this hiatus as uncertain. Brown observes more definitely that the gravels in which the Bhutra boucher was discovered were as old as 400,000 years ago. But it is very probable that in India (as in Europe) there was no such big hiatus and that the tradition from the one to the other stage of culture was gradual. The old Palaeolithic sites on the Sabarmati and elsewere (*e.g.* Narnavaram, Chingleput District) might have been deserted for long ages and then occupied by the neolithic colonies, thus causing variations in the levels of their fossil remains. Further, as has been already pointed out, some of the latest palaeoliths show neolithic characteristics in a limited form, indicating the gradual transformation of the Old Stone age into the New Stone one. Again, the latest remnants of the palaeolithic age discovered at Chakradharpur show that the later aboriginal tribes, whom we meet with in the earliest historical period, were apparently the descendants of the palaeolithian men, still pursuing, in most respects, the culture of that age.

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[1] Ind. *Pre-his. Proto-his. Antq.*, pp. 16-17 and Brown's *Pre-his. Antq. Ind. Mus.*, pp. 2-3.

However it might have been, we can safely take it that the earliest phase of the neolithic culture in India began some time between 10,000 and 7,00 years before Christ. The Narbada finds belonged to the earliest palaeolithic, if not eolithic times; the Karnul caves to mid-palaeolithic times; and the Chakradharpur and Chingleput finds to late palaeolithic period. The first of these epochs has also been styled Negroid in consequence of the close touch with the African peoples; the second Australoid, in consequence of close cultural contact with Australia. Ethnologically, we shall presently see, the three periods may be called Negrito, Pre-Dravidian and Dravidian; for it is now generally agreed that the 'Dravidians', whether regarded as indigenous or foreign to the country, began to be active in the transitional period between the Old and New Stone ages.

PALAEOLITHIC AGE AND ETHNOLOGY

The correlation of palaeolithic artifacts with ethnology, however, is an exceedingly obscure problem in India unlike in Europe where the question has been well thrashed out. The aurignacian, solutrian and other later divisions of the palaeolithic epochs in Europe have produced evidences to show that there were at least three different types of Old Stone men. The earliest of the aurignacians were a clearly long-headed race. The Cro-magnards, on the contrary, whose remains have been discovered at Cro-magnon in France, were a brachy-cephalic people. These are supposed to be the progenitors of the Alpine race who extend along the plateaus and uplands of South Europe and Western Asia from Britanny to the Hindu-kush. It has been suggested by some scholars who do not grant the Mongolian element in the Bengalis that the brachy-cephaly of Western India and Bengal was probably the extension of the Alpine race, quite distinct from the Mongolian brachy-cephaly further north and east of Bengal. The finds of palaeolithic Europe have revealed, in addition to the above two human types, a third. This is a dolicocephalic race akin to the Negroids. As the Negroid strain has been discovered in North Italy, we have to take it as due to the push of the Negroids from the Egyptian border. During the closing centuries of the palaeolithic epoch and the transition to the neolithic, we find the ancestors of the modern races settling permanently. The Cromagnards apparently 'became the Alpines.' The Negroids perished in the struggle and became confined to Africa. The major portion of Europe—including the regions like Russia and Bavaria which are now occupied by broad-headed peoples—came to be occupied by a dolico-cephalic race which, it is believed, was connected with the old aurignacian and which, is, at all events, supposed to have given rise to 'the Mediterranean race.' This race occupied the lands on both sides of the Mediterranean and became in Europe the ancestors of (1) the peoples of South Europe (2) the Iberians, (3) the Nordics of the further north. In Africa this race became the progenitors of the Hamites and Egyptians. In the Asiatic side it gave rise to the Semitic and Babylonean peoples of Mesopotamia. It has also been suggested that this dolico-cephalic, Mediterranean race must be connected with the Dravidians of India and, according to some who do not grant (rightly in my opinion) the distinction between the Aryans and Dravidians, with the Aryans as well. Palaeolithic India was occupied by the pre-Dravidians, now represented by the hill-tribes, with a certain mixture of the Negrito element. Some connect the 'Kols' and 'Indonesians' with hill-tribes; but others would connect them with the Dravidians and not pre-Dravidians.

BIBLIOGRAPHY

Numerous works are available on the palaeolithic age in Europe and elsewhere. The ethnological aspects can be succinctly studied in Dr. Haddon's *Races of Man* and his *Wanderings of peoples*. Of the special publications on India the earliest and, in some respects, the best is the *Catalogue of Pre-historic Antiquities in the Government Museum, Madras*, prepared by Bruce Foote in 1901. This catalogue was prepared by him as a labour of love. He was then engaged in framing a catalogue of his own valuable collections. To do so he made a comparative study of the Madras Museum collection. At the request of Mr. Thurston, he utilized this opportunity to frame this catalogue.

The preface of 19 pages is a very valuable analysis of the pre-historic finds in India. The author incidentally gives much information about the history of the finds. He gives, among others, the contributions made by J. W. Breeks whose finds in the Nilgris form even now the pride of the Madras collections. The next and the most indispensable work on the subject is Bruce Foote's *Indian Pre-historic and Proto-historic Antiquities* (Madras 1914), which contains a bare list of the collections made by Bruce Foote and sold by him to the Madras Government in 1904. Bruce Foote's *Notes on the Ages and Distribution* of the above, published by the Madras Government in 1916, is an indispensable mine of information. Logan's Chipped *Stones of India* (Calcutta 1908) is the earliest good book in the field which gave a readable description of the history and characteristic of the different soils and their influence on artifacts, and which contains views refuted by Bruce Foote. The author attributes Indian palaeolithic culture to European influences contrary to the opinions of almost every other writer. He is the only writer who makes an interesting and instructive attempt at the relative chronology of Indian stone finds. One defect in him is he is not clear in differentiating sufficiently the palaeolithian from the neolithian ones. A later book than Bruce Foote's *Notes* is the *Raisonne Catalogue of the Calcutta Museum Antiquities* by J. C. Brown, published in 1917. It is a valuable supplement to Bruce Foote and gives considerable bibliographical literature in connection with every find. Mr. Panchanan Mitra, in his *Pre-historic India* (Calcutta University, 1924 and 1927) has put all the available literature in a readable form and has made a genuine attempt at guaging India's place in the history of stone age culture. Lastly may be noted *The Stone age in India* of Mr. P. T. Srinivasa Aiyangar, published by the Madras University as one of the series of the Sir S. Subrahmanya Lectures (1926). It is a succinct and lucidly presented as well as suggestive monograph on the subject. The author's suggestions and interpretations are always brilliant, but often indifferent to actual historic environment and previous works on the subject.

CHAPTER IV

TRANSITION TO THE NEOLITHIC AGE
ETHNOLOGICAL BASIS

We have already seen that during the palaeolithic period India was perhaps occupied by races which were closely akin to the Negritos on the one hand and to the dolico-cephalic peoples of Australia in the East and the Negroids of Africa in the West. It is very probable that the mixture of these tribes gave rise to the pre-Dravidians, whose descendants form the hill-tribes of later and modern times. The Kadirs, the Paniyans, the Sholagas, the Irulas of the mountains and the Kurumbas of the plains with their flat and broad nose, their thick lips, their wild and matted though not woolly hair are the descendants of these. The composite character of the ethnology of these jungle folks is seen in the fact that while they are, like all the people of S. India, dolico-cephalic, their dolico-cephaly is of a much more primitive type; for the vault of the head is too low and the direction of the brain backward. They also occasionally show a prognathic face while they are as a rule orthognathic (like the others). In their very short stature, low forehead, flat face and nose, and extremely dark complexion, they indicate the connection with the Negrito race. In their physical resemblance to the Vedahs of Ceylon, the Sakas of Malaya, the Toalas of Celabes and the aborigines of Australia they show the connection with the Australoid stocks. The anthropological evidences are corroborated in the latter case by the evidences of customs and habits. Both the South Indian and Australian tribes are totemistically organized. The Kadirs of the Anamalais and the Mala-vedahs of Travancore clip their teeth just like the Malayan Jakuns before marriage. The Diaks of

Borneo resemble the Kadirs in their methods of tree-climbing. The bamboo combs of Malacca resemble those of the Kadirs though they serve as charms in one case and as auspicious presents by bridegrooms in the other. Similarly the resemblances to the African Negroids are conspicuous in some features—the woolly hair, the extremely dark complexion, etc. often found among some of the hill tribes.

The pre-Dravidians seem to have been conquered, in course of time, by the Kols, the Mundas or the Kolarian peoples who probably formed a unique race by themselves and who occupied the wide region ranging from the mountains of West Bengal to Australia. Both Dr. Haddon and Sten Konow maintain that the Kolarans were a wide continental race who have left their influence throughout this wide region. The Kols might have had their origin in Hindustan as Haddon believes or might have come from the dolico-cephalic peoples further west. They might have also been earlier sections of the Mediterranean race to which the later Dravidians belonged. But this seems to be denied by the majority of scholars. In any case the Kols spread themselves over all the islands and continents to the east of India as far as Australia. The Austric family of languages was the language spoken by this people. It has left many local names in all these areas which have even now currency. Dr. Sten Konow believes that the Kolarians at one time occupied the vast area of North India ; " that the existence of the Kurku tribe in the heart of India seems to point to the conclusion that people of a similar descendancy have occupied a large territory in the central parts of the country and probably also in the Dakkan." He makes the natural inference from this that much of the Indian folklore may have a Kolarian origin. The tales of sea-voyages, he believes, were probably due to them, not to the later Dravidians or Aryans. Similarly, he contends, they probably had an influence on the germs of art, religion and philosophy.[1]

On the other hand the Kolarians have been ethnically connected with the Dravidians, though in a lower cultural level. The arguments in favour of this theory are (1) the resemblances in physical characteristics between the two races and (2) the resemblances in the languages. While there is no denial of the former, the latter has been denied by some scholars who maintain that the Munda languages were entirely different from Dravidian in structure and grammar and vocabulary. On the whole the theory of separateness seems to have gained the upper hand.

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[1] See J.A.S.B., 1925, No. 3, p. 315.

Whether the Munda-speaking peoples and the Dravidians belonged to the same race or not, there is no doubt that it was in the close of the palaeolithic period and in the early centuries of the neolithic period that the Dravidians, from whom the vast majority of the peoples of India are derived, first came to prominence. Resembling the pre-Dravidians in their dark skin, their plentiful and curling hair, their orthognathic face, their dolico-cephalic head, the Dravidians however were distinguished from them by their slightly taller stature and by their mesorhine, not platyrhine nose. According to some scholars, the Dravidians had a distinctly indigenous origin. We are told for instance that the Dravidian terms indicating direction are derived from the configuration of the southern peninsula. The east is known for example among the Tamils as *kilakku* or down and the west as *merku* or up; and these terminologies could, it is pointed out, have come into existence only among a people who were indigenous to South India, where the country slopes downward towards the sea and rises upwards towards the Ghats. The advocates of the indigenous theory further say that the primitive and ancient peoples who used stone implements and left cairns and stone circles to indicate their burying places were the ancestors of the Dravidians and that the differences between them lay not in race but in culture. For this reason Dr. Macleane divided the people of South India into Tamilian and pre-Tamilian. Amongst the pre-Tamilians he placed the Kurumbas, the Irulas, the Kadirs, the Vedahs of the mountains and the Sanars, Pariahs, Pallas, Chaklers and Pulayas of the plains. Among the more cultured Tamilian tribes he placed the Konds and Gonds of the north, the Todas, Badagas, Vellalas, Kallas and Maravas. The Konds and Gonds, he adds, had owing to their geographical situation a slight mixture with the Mongolian element. The Nayars and Nayudus, he believed, were pure Dravidians altered by culture and customs. This theory of the indigenous Dravidians is supposed by some to be proved by the Tamil origin of the Ceylonese traditions concerning the submergence of wide areas of land which, it is said, were originally inhabited by the Dravidians. The generality of the modern scholars, however, have concluded that the Dravidians were not indigenous but alien immigrants who, in the earlier centuries of the neolithic epoch, when there were large racial movements in Europe and Asia, came to India and settled here after overthrowing the previous populations and driving them into jungles or enslaving them in the plains.

THE TERM DRAVIDIAN

Before studying the various theories in connection with the foreign origin of the Dravidians it is necessary to glance at the meaning and history of the term itself. We may note at the outset that it was Dr. Caldwell[1] who first used it to denote the South Indian peoples. Before his time these had been styled *Tamilian*, but as *Tamilian* signified the Tamils proper and all South Indians, Caldwell confined the term *Tamilian* to the Tamil-speaking peoples alone, reserving the term Dravidian to denote the larger sense, that is to cover the Tamil, Telugu, Kanarese, Malayala and other allied groups. The reason why Caldwell chose the term Dravidian was that Sanskrit writers referred to the southern peoples as *Dravidas*. It is true that Caldwell's choice in this respect is not quite fortunate, for as a matter of fact, Sanskrit writers[2] use the term Dravida not in connection with the non-Brahmanical sections in South India but with the Brahmanical immigrants there. The term *Panchadravidas*, for example, denoted the Brahmans of the five most prominent divisions in the south as distinct from the *Pancha Gaudas* of the north. The Brahman child-reformer Gnanasambanda is apparently styled *Dravidasisu* by Sankara. The family name *Dravid* in the Bombay Presidency, again, is the family name of Brahmans. The term Dravida thus was originally used by Sanskrit writers only to indicate South Indian Brahmans. Caldwell's use of it to indicate the non-Aryan peoples is thus not warranted by Sanskrit literary tradition; but the term has long been used in the Caldwellian sense and it will perhaps be pedantry at this stage to give it up. Further, Sanskrit writers themselves seem to have also used it in a broad geographical sense meaning South India in general.

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[1] See *Comparative Grammar of the Dravidian Languages*, pp. 6—11.

[2] Varahamihira in his *Brihadsamhita* uses this term. It may be added that Vedanta Desika speaks of the *Dramidopanishad*.

But the important point to be noticed is that Caldwell derived the term *Tamil* from the word *Dravida*. It is true that Tamil scholars derive the word from *tam* sweet, and *il* language (?); but, as Caldwell says, this derivation " has nothing to support or commend it but its agreement with the estimate formed, by the Tamilians, of the euphonious character of their native tongue." Tamil is a *tadbhava* of *Dravida* or *Dramida*. " The Sanskrit name corresponding to Tamil is Dravida, a word which denotes both the country inhabited by the people called the Dravidas and the language spoken by them. And I have come to the conclusion that the words Tamil and Dravida, though they seem to differ a good deal, are identical in origin. Supposing them to be one and the same word, it will be found much easier to derive Tamil from Dravida than Dravida from Tamil." The objection may be raised against this, that a people living in the extreme south of the country would not call themselves by a name bestowed upon them by another people; but it is probable that the Sanskrit word, the meaning of which is unintelligible, was a pre-Aryan word. This obscurity of original significance, contends Caldwell, is no argument against the direct derivation of the word from the Sanskrit Dravida. The phonetic transition, in fact, from the one to the other is very easy In its first transformation it changes to Dramida (தரமிட), then to Dramila (த்ரமிள), then to Damila (தமிள) and then to Tamil (தமிழ்), illustrating, in its different stages, the change of ட into ள, the softening of த்ர into த, and the hardening of the soft initial த into the hard த, and the replacement of ள by ழ.

THE MONGOLIAN THEORY

Among the scholars who attribute a foreign origin to the Dravidians there are many schools. The late Kanakasabhai Pillai traced them to the Mongolian race. He held that they must have migrated from the wild Tibetan uplands into India by the Himalayan passes in Tibet and Nepal probably in the period which had already seen the settlement of the Punjab by the Aryans. Kanakasabhai believes that it was this race of invaders that are called *Yakshas* in Sanskrit literature, *Yakhos* in Buddhistic literature and *Yeuchi* in Chinese histories. The invaders, continues Kanakasabhai, spread themselves over the whole of Bengal and thence emigrated by sea to South India and Ceylon. In the reference, in the *Ramayana*, to the wanderings of Yakshas in the Mahendra mountain and in the Sinhalese tradition that Vijaya, the leader of the first Aryan colony into Ceylon, found the island in the possession of the Yakshas and further married Kuveni, a Yaksha princess, Kanakasabhai sees clear evidences of the Yaksha occupation of the south. This colonisation, he continues, was followed by the acquisition, by the colonists, of the name *Tamil* for the reason, he opines, that they probably left Bengal by the great port of Tamralitti. "The name Tamil appears to be therefore only an abbreviation of the word *Tamralittis*". Proceeding further, he argues that the first of the Tamralitti tribes to emigrate were probably known as the *Marar*,[1] and that the later Pandyas who called themselves Marar were descended from them. The next tribe to migrate, says Kanakasabhai, were probably known as *Tirayar*, or sea-kings. "They were a great sea-faring race whose home appears to have been Lower Bengal and who travelled by sea to Burma, Cochin-China, Ceylon and Southern India." From the fact that the later Tamil literature mentions a chief of Conjeeveram named *Tirayan* who claimed to be a descendant from Vishnu, whose bed is the ocean, Kanakasabhai infers that the *Tirayars* were identical with the Sagarakula of the Puranas and that they were solar in origin. What is more germane to our purpose, he connects the Cholas with the Tirayar. He points out that, according to Tamil literary legends, the earliest of the Chola kings was Muchukunda who, it is said, helped Indra against the Asuras, got the help of five divine giants, destroyed the Nagas who then ruled over Kaveripattanam and took possession of it, changing its name into Champapati, after Champanagar, "an ancient capital of Bengal from which they had emigrated" The Cholas and the Tirayar were thus identical; and the mention of many communities whose name ended in *tirayar* in later days[1], concludes Kanakasabhai, is an evidence of their early colonisation and continuous possession.

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[1] The basis on which he relies in regard to this point is the possession of the name *Palaya*, old, by the chief of the Marans in the age of Tamil classical literature. The chief would not have called himself, says Kanakasabhai, *an ancient man*, unless he regarded himself as the chief of the earliest settlers. Kanakasabhai further identifies the Marar with the Mranmars who conquered Burma.

Besides the Marar and the Tirayar, the alleged originators of the Pandyan and Chola peoples, there were two other prominent "Tamil" tribes who, according to Kanakasabhai, settled in the south. These were the *Vanavars* and the *Kosars*,[2] the latter of whom, however, he acknowledges, were later than Asoka's time and therefore need not engage our attention at present. The Vanavars, says Kanakasabhai, were "evidently natives of a mountainous region in the north of Bengal, and when they settled in Southern India, they chose for their residence hilly tracts, such as the Kolli hills in the Salem district, the Western Ghats and the Nilgiris. The Chera kings belonged to this tribe and called themselves *Vanavar* or celestials". Connected with the Vanavars of the Himalayas, the Chera kings adopted the titles of Vanavarman and Hiranyavarnam. Their political connection with the Himalayan tribes, points out Kanakasabhai, is evidenced not only by this agreement in terminology but in the striking similarity which, as Fergusson shows, existed between the architecture of Malabar and Nepal. "In fact there are no two tribes in India," said Fergusson, "except the Nayars of Malabar and Newars of Nepal who have the same strange notions as to female chastity, and that, coupled with the architecture and other peculiarities, seems to point to a similarity of race, which is both curious and interesting." Fergusson was not sure when the connection took place. He did not place much faith in the similarity of names, but was convinced, from the architectural and other peculiarities, that there must have been such a connection. Kanakasabhai considers that the racial connection which Fergusson surmised is amply demonstrated by the lessons which he has drawn from Tamil literature. He sees in the Malabar *Vanavar* the solution of the problem which puzzled the talented historian of art.

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[1] For example, Pangala Tirayar (Bengal Tirayas), China Tirayar, (those of China or Cochin-China), Kadarattirayar (Tirayar of Burma), Singalattirayar (those of Ceylon) and *Pallavattirayar* in Tondamandalam.

[2] Kanakasabhai Pillai believed that the *Kosar* were the Kushans, "a branch of whom conquered Bactria in the 2nd century B. C. and the North-western province of India in the first century B,C."; that immediately after their invasion, they attacked Mogur, the capital of Palayan Maran, and being defeated there obtained the assistance of the Vamba-Moriyar or 'illegitimate Moriyas who "were on the Magadha throne in the 3rd or 2nd century B. C.," and saw the chariots of their allies drive on the Podiya hill. "In the first century A.D. they were the masters of the Kongu country; while in the Pandyan country they were the most honoured of the subjects of the Pandya, inferior in rank only to Palayan Maran." It was on the bases of the above suggestion that Pandit Raghava Ayangar later on argued in favour of 5th century for the date of the Tamil Sangam and Dr. Krishnasami Ayangar improved upon it by enunciating the theory of Mauryan invasion of the south as far as the Podiya hills.

The advent of the 'Tamils' from Bengal into the Peninsula, says Kanakasabhai, was followed by the rise of the *Tamil* language as a result of the mixture of the tongue of the conquerors with that of the conquered "Nagas and Dravidians"[1] But what evidence is there to show that Tamil was the creation of these conquerors? Kanakasabhai sees an indisputable evidence in the letters ழ, ற, ஞ, ள. He believes that the Tamil ழ, is not found in other Dravidian languages or

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[1] It will be seen that Kanakasabhai identifies the Dravidians with the Nagas and not *Tamils*, who, according to him, were foreign Mongolians.

Sanskrit and that that it must have been brought by the Tamil immigrants from their original Tibetan homes (where it existed) and that the nasal letters of Tamil and Malayalam afford "further evidence of the affinity of the Tamils and the Burmese and Chinese, the latter of whom call themselves *celestials* like the ancient Cheras, who were known as Vanavar, celestials." Kanakasabhai concludes that the modern Malayalam "preserves that form of language which was spoken by the early Tamil immigrants, some time after they had settled in South India. They had then learnt to use Dravidian words, but were not familiar with the personal signs of verbs. In this condition the Malayalam resembles the Mongolian, the Manchu and other primitive tongues of high Asia."

THE DEFECTS IN IT

Scholars will readily acknowledge the originality, the erudition and the cogency which characterise the above investigations. But evidences have accumulated since the publication of Kanakasabhai's monumental work, which go to demolish every bit of his premises and conclusions. To the ethnologist it is plain that, to use the weighty language of Sir Herbert Risley, "it is extremely improbable that a large body of a very black[1] and conspicuously long-headed type should have come from the one region of the earth which is peopled exclusively by races with broad heads and yellow complexion. With this we may dismiss the theory which assigns a trans-Himalayan origin to the Dravidians". To the philologist the identification of Tamralitti with Tamil, of Marar with Mranmar, of the Kosar with the Kushans, will look extremely fanciful. Historically, again, they are inconsistent. The identification of the Yakshas, again, with the "Tamils" is a pure surmise; while the inference that the Marar were the earliest immigrant tribe because they had a chief named Palayan, is questionable. The theory regarding the Tirayars, their connection with the solar line and the Cholas, their occupation of the Naga town of Kaveripattanam, etc., is a hopeless muddle of puranic legends of a later period. The connection of the Vanavar with the Himalayan and Chinese tribes is a pure speculation. The architectural and social similarities between Malabar and Nepal might be due to accident or to the survival of certain 'Dravidian' customs which had prevailed in the age when the whole country was under 'Dravidian' occupation. With regard to the letter ழ the answer to Kanakasabhai Pillai can be best given in the words of Mr. M. Srinivasa Aiyangar, whose opinions and conclusions are entitled to great respect. He points out that that letter "*did* exist in the ancient Kanarese and Telugu languages, though it had disappeared owing to the continuous Sanskrit influence for centuries. In modern Kanarese and Telugu it has been dropped or its place taken by ள and ட. As Caldwell has rightly said, this letter has sometimes the sound of ள or ய or is even omitted as in modern colloquial Tamil. And it might further be remarked that ழ which has the sound approaching the English *zh* (as in pleasure) or the French J (as in *J'ai*), may be found in some of the languages of the Ural-Altaic group. The mere fact therefore, that it is found to prevail equally in Tamil and throughout the Indo-Chinese tongues of the Himalayas and Tibet is by itself insufficient to establish an ethnic relationship between the two races especially when there are so many and so strong arguments to the contrary. Further, there is not the slightest affinity between the Tamil and the Tibetan tongues," as there has not been the slightest resemblance in physical appearance. Lastly Kanakasabhai Pillai has no correct idea of the history of the Kushans and the Mauryas. Every bit of his gigantic structure has been built on slender foundations and is characterised by gross anachronism. For these reasons we may conclude that Kanakasabhai Pillai's Mongolian theory is untenable.

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[1] Risley exaggerates the blackness because he did not distinguish the Dravidians from the pre-Dravidians.

THE SCYTHIAN, TURANIAN OR CENTRAL ASIAN THEORY

The most formidable of the immigration theories is that of Caldwell, which assigns the original Dravidians to the Turanian homeland of Central Asia. His view is that the Dravidian languages have got, in many respects, the features of the Scythian linguistic group (that is, Finnish, Turkish, Mongolian and Tungasian), thus indicating a racial affinity. "All these languages are formed on one and the same grammatical system, and in accordance with the same general laws. They all express grammatical relation by the simple agglutination of auxiliary words or particles; whilst in the Semitic languages grammatical relation is expressed by variations in the internal vowels of the roots, and in the Chinese and other isolative, mono-syllabic languages, by the position of words in the sentence alone.[1] The Indo-European languages appear to have been, equally with the Scythian, agglutinative in origin; but they have come to require to be formed into a class by themselves, through their allowing their agglutinated auxiliary words to sink into the position of mere signs of inflexion." It is true that "in some important particulars the Dravidian languages have undoubtedly approximated to the Indo-European, especially in this, that, instead of continuing to be purely agglutinative, they have become partly inflexional. Several of the words of relation used as auxiliaries in declension and conjugation have ceased to be capable of being used as independent words. Still," Caldwell continues, " It would be unnecessary, on this account alone, to disconnect these languages wholly from the Scythian group; for those auxiliary words, though they have now, in some instances, shrunk into the condition of fossilised relics, are always separable from the roots—as such words have generally done in the Indo-European languages—as to form with the roots only one integral word, in which it is almost impossible to determine which is the root and which is the modificatory element. Caldwell, in short, sees much affinity between Dravidian and the Indo-European as well as Scythian groups, but regards the connection with the latter as the more significant.

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[1] Campbell says: "The languages of the *aborigines* seem to have all this much in common—that they are of the structure described as Turanian. But Campbell interprets Turanian not as Tibetan or Mongolian but as Asia-Austric, *i. e.*, denoting Polynesian, Negrito (of the Indian archipelago), Australian, etc. Under 'aborigines' he includes the Dravidians and the Mundas.

Caldwell sees a remarkable confirmation for this Scythian theory in the translation of the Behistun tablets. "The inscriptions discovered at Behistun or Bhagistan in western Media," he says, "record the political autobiography of Darius Hystaspes in the old Persian, in the Babylonian, and also in the language of the Scythians of the Medo-Persian Empire." The Scythian portion of the inscription, points out Caldwell, enables a comparison of the Dravidian and Scythian idioms; and as the result of such a comparison, he enumerates nine points of grammatical resemblance between the two. In the use of consonants of the cerebral class, in the conception of a consonant as a surd in the beginning of a word and the doubling of it but as a sonant in the middle of a word and when single; the practical identity of the genitive and dative suffixes; in the identity of the pronoun of the 2nd person; in the use of a relative participle and in the similarity of the imperative negative particle (of *inni* of the tablets and *ninni* of Gond), he sees resemblances which show a "radical, though remote, connection."

Caldwell does indeed recognize that there are some discrepancies between the Scythian and Dravidian systems—for example in the conjugation of the verbs—but he considers that these are more than counterbalanced by the resemblances. Again, he concedes, as has been already pointed out, both in grammatical forms and roots, the Dravidian languages are more like the Indo-European languages—Sanskrit, Greek, Gothic, Celtic and Persian. In the use of *n* for instance to prevent hiatus, in the existence of gender in the third person pronouns and verbs, in the use of *d* or *t* as the sign of the neuter singular of demonstrative pronouns or pronouns of the third person, in the existence of a neuter plural (as in Latin), in the formation of verbal nouns by the lengthening of the vowel of the verbal root and in the identity of a number of roots of words, he sees analogies between the Dravidian and Indo-European systems. The analogies are in many cases conspicuous not when compared with Sanskrit but some allied tongue like Greek, Latin, etc. He gives 35 examples of words which, he considers, have been derived both by Sanskrit and Dravidian from the same roots as contrasted with 104 examples of words which show the affinities between Dravidian and "the extra-Sanskrit or west Indo-European languages." He concluded from this that the Dravidian languages were not influenced by the Scythian group alone and that they must have been also shaped, to a certain extent, by that original tongue which had given rise to the Indo-Aryan languages. Still, in the main, he concludes, the Dravidian tongue is Scythian.

THE BRAHUI EVIDENCE

The evidence on which Caldwell lays great emphasis in order to prove the immigration of the Dravidians from Central Asia through the north-west is the resemblance of the language of the Brahui, a Baluchi tribe of the Kirthar mountains, with Dravidian. In both, the cases of nouns are denoted by post-prepostions. In both, the gender is expressed not by inflexions but by separate words, and the number also by separate articles of pluralisation like many, several, etc. In both, adjectives have no comparative and superlative degrees. The second personal pronoun, in both, is the same. In both, the second person plurals of verbs end identically. In both, again, there is the reflexive pronoun தன். The Brahui numerals for 2 and 3 are the same as the Tamil and Telugu ones. From these and other arguments Caldwell concludes that the Brahuis must have been one of the numerous Dravidian tribes which found their way into Hindustan. The opinions of Caldwell have not gone unchallenged in this respect. It has been pointed out, for example, that the Brahuis are ethnically very different from the Dravidians, and that they could not have belonged to the same race. Secondly it has been suggested that the linguistic affinities might be due to mutual intercourse between them and the Dravidians during the stay of the latter in the trans-Vindhyan region, and not necessarily to racial affinity.

THE TURANIAN THEORY UNTENABLE

The Turanian theory has also been adversely criticised on other grounds. As C. E. Gover[1] says, "the progress of philological enquiry and the new means of analysis furnished by the great German writers on language have shown the error of this classification. . . As an interesting example both of the true character of the language and the linguistic progress made since the publication of Dr. Caldwell's book, it may be noted that the learned Doctor gives an appendix containing a considerable number of Dravidian words which, he asserts, to be Scythian, as the most efficient witnesses to prove the Turanian origin of the language. It is now known that every word in this list is distinctly Aryan, although some of them have representatives in the Finnish group of Turanian tongues—the group which has been most constantly exposed to Aryan influences. The greater portion of them are included in Fick's *Indo-Germanioches Grundsprache* as Aryan roots, although Fick does not appear to have seen Dr. Caldwell's work." Another eminent scholar[2] does not admit the existence of a Turanian linguistic family. He considers it to be "an absurd and inadmissible hypothesis which neither facts nor reasoning can support. Each group in the so-called family is quite independent from all others, and exists by itself unconnected with one another: such is the case with the Basques, the Ugro-Finnic, the Kolarian, the Japanese, the Maleo-Polynesian, etc......Dr. Caldwell's opinion that the Dravidian may be related to a pretended Scythian group is equally unfounded" (Jules Vinsen). It is "a very stupid assertion" like the one made by "some amateurs that Tamil and Australian are of the same origin."

It is not only philology but also ethnology that stands in the way of the Turanian theory. The objection which has been raised against Kanakasabhai Pillai's Mongolian theory is equally applicable here. The Dravidians are a dolicocephalic race, closely akin to the Aryan in this respect and not brachy-cephalic. "The physical characteristics of the Tamilian type," says Pandit Savirirayan, "are a dolico-cephalic head, unmarked cheek-bones, long, black and curly (but not woolly) hair, black and bright eyes, pointed, if not aquiline (but never evidently platyrhine) nose, fair skin—the colour of it being fairer than No. 28 of Broce's colour types. These are the characteristic features of all South Indian castes or tribes that are admittedly Tamilian". These Aryan-like features can hardly have existed in a community alleged to have migrated from the Mongoloid region. The study of the morals and literature of the Tamils and Turanians, continues the Pandit, shows the same thing. "The Turanians were a people who had hardly any literature, morals or aspirations of a civilised race. A large number of them belonged to the lowest palaeozoic strata of humanity." They were "peoples whom no nation acknowledges as its kinsman, whose languages, rich in words for all that can be eaten or handled, seem absolutely incapable of expressing the reflex conceptions of the intellect or the higher forms of the consciousness, whose life seems confined to the glorification of the animal wants with no hope in the future and no pride in the past. They are for the most part people without a literature and without a history, and many of them apparently as imperceptible as the Ainos of Jesso or the Veddahs[2] of Ceylon—people whose tongues in some instances have 20 names for murder, but no name for love, no name for gratitude, no name for God." Certainly such a race, the Pandit concludes, can hardly be said to have been the progenitor of one which produced one of the most copious, refined and polished languages spoken by man and a literature not less copious or noble than Greek or Latin or Sanskrit. These arguments require revision in the light of later researches in ethnology. It is not now maintained, for example, that all the

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[1] See his *Folksongs of S. India*, pp. 6-7.

[2] In the *Siddhanta-dipika*, Vol. V., p. 193, reproduced in the *Tamilian Autiquary*, No. 1, p. 12.

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[1] See *Tamil. Antq.*, Vol. I., pp. 13-14.

[2] It will be seen that the Pandit relegates the Vedahs to a position inferior to that of the Dravidians. Though he was unaware of it ethnology supports him.

races who inhabited the region traditionally associated with 'the Turanians,' where brachy-cephalic. It is now conceded that there were dolico-cephals among them, and there is nothing intrinsically impossible in a dolico-cephalic people coming from that origin. But the philological arguments of Dr. Caldwell can be pronounced to be speculative, and, as will be shown presently, there are other grounds against 'the Turanian view.'

SEMITIC THEORY

Still another theory regarding the Dravidians is that they were Semitic in origin. One proof of this is said to be in the institution of the *Marumakkattayam* law, which prevailed in Arabia, Egypt, Asia Minor and Ancient Greece. A variation of the *Marumakkattayam* is said to be the *Menarikkam*, the marriage between the children of brother and sister. The *Marumakkattayam* and the worship of women, it has been pointed out, is a common feature of the Semitic and Dravidian cultures, clearly indicating that the latter must have got it from the former. As against this theory, some scholars have pointed out that the Dravidians are more Aryan than 'Semitic' in their anthropological features; that their language also is more akin to the Aryan; that the worship of women as well as matriarchy is universal rather than Semitic institution. The anthropological objection does not, it is now recognized, hold; for the Semitic people were not brachy-caphalic but (like the 'Dravidians') dolico-cephalic; but the objection to the Semitic theory is that it is more one of omission than commission. The arguments on which it is based can be given not only to prove a Semitic origin but, as we shall presently, the Mediterranean race theory as well.

THE MESOPOTAMIAN THEORY

Col. Holdich, in his *Gates of India*, lends his support to the theory of Mesopotamian origin of the Dravidians. He opines that the 'Dravidians' originally occupied some region in the vicinity of Mesopotamia and that they migrated from there to the Indian border-land 'in the illimitable past' through the Makran coast. "Some of them" he continues, "remained for centuries either in the coast line, where they built strange dwellings and buried each other in earthen pots, or they were entangled in the mass of frontier hills which back the solid Kirthar range, and stayed there till a Turko-Mongol race, the Brahuis (or Barohis, *i.e.*, the men of the hills) overlaid them and, intermingling with them, preserved the Dravidian language, but lost the Dravidian characteristics." The Brahuis were thus, according to Holdich, a Mongol race who conquered the old Dravidians, but, who, on account of the vitality and persistency of the Dravidian tongue, adopted the latter. In fact, "they have preserved the traditions of their fathers and adopted the tongue of their mothers,"—an eloquent proof to show that a language can hardly be permanent unless preserved by women. "What we learn from the Brahuis is that a Dravidian race must once have been where they are now, and this supports the theory now generally admitted that the Dravidian peoples of India entered India by these western gateways." Col. Holdich goes on to inquire how they, having got thus far on their way, succeeded in getting to the south of the peninsula. "It could only have been the earliest arrivals on the frontier who passed on. Later arrivals from Western Persia (amongst whom we may reckon the Medes or Meds) remained in the Indus valley. The bar to the frontier progress lies in the desert which stretches east of the Indus from the coast to the land of the five rivers. This is India's second line of defence, and it covers a large extent of her frontier . . . There was a time when the great rivers of India did not follow their courses as they do now. This was most recently the case as regards the Indus and the river of Central India. In the days when there was no Indus delta and the Indus emptied itself into the great sandy depression of the Rann of Cutch, another great river from the north-west, the Sarasvati, fed the Indus and, between them, the desert area was immensely reduced, if it did not altogether disappear. Then, possibly, could the cairn-erecting, stone-monument-building Dravidian sneak his way along the west coast within sight of the sea, and there indeed has led his monuments behind him. Otherwise the Dravidian elements of Central Southern India could only have been gathered from beyond the seas; a proposition which it is difficult to believe. However, never since the desert strip was formed, which now flanks the Indus to the east, can there have been a right of way to the heart of India by the gateways of the west." Bruce Foote takes the further investigation of the Dravidian route at this stage, and points out that the Dravidians (whom he is unable to definitely assign to the palaeolithic or neolithic stage of culture), must have left the coast north of the gulf of Cutch and Cambay and proceeded inland; for, they would not have had the vessels of necessary size for crossing them. The absence of lithic relics or tools in the coast of Kathiawar, he opines, is a corroboration of this. He therefore believes it far more likely "that the Dravidians crossed the Indus above its embouchure into the great fresh-water lake, which filled the depression now known as the Rann of Cutch, kept along its northern shore, and did not trend southward till they had reached the Sabarmati valley, which they descended keeping inland from the head of the Gulf of Cambay. Following this route, they would find little material for the construction of any magalithic structures such as are attributed to them, till they got south of the Tapti valley by which they may well have reached the great Deccan trap plateau and with much greater ease than by any of the more southerly passes. Once on the plateau, their route offered no serious obstacles to reaching the Deccan proper. That they continued southward from the Tapti valley and followed the coast line of the Concan seems less probable, for, coming from the mountains of South Baluchistan, they would generally prefer the cool, dry climate of the Deccan plateau to the damp, sweltering heat of the coast. Moreover the Concan was, in those days, most likely densely covered by forest far thicker and more impenetrable than that growing on the Trap area a few miles eastward of the coast of the Sahyadri or Western Ghats, where the rain-fall has already decreased very greatly. That the immigrants, whether palaeolithians or neo-lithians, avoided the great forest region of the Sahyadri range is, I think, an undoubtable fact; for, when surveying part of that region in the early soventies of the last century very closely, and climbing up and over a very large number of the ridges and plateaus within the forest area, I came across no pre-historic relics of any kind whatever, whereas as soon as I turned away from the forest into the more open country, I found both palaeoliths and neoliths sporadically and in increasing numbers the further I got away eastward." For the same reason, the forest regions of West Mysore, Coorg, etc., could not have been occupied in neolithic times. It was only after the advent of iron that they could have been possibly cleared.

THE EGYPTIAN THEORY

A theory which has got the support of some of the most authoritative ethnologists of recent years is that the Dravidians belonged to the same race as the ancient Egyptians "They are certainly," says Bruce Foote, "not Mongoloid in their appearance. Might they not possibly be representatives of the brown race described by Prof. Elliot Smith, F.R.S. in his learned and yet charming little book 'the Ancient Egyptians'? Could they not be a branch of that race which migrated eastward before the invention of the copper axes which enabled the Egyptians to subdue so many of their neighbours? The copper weapons were certainly unknown to the early Dravidians in South India who, it would appear, lived in a purely neolithic time; for in several hundred neolithic sites that I examined closely I found not the ghost of anything made of any metal whatever." Prof. Elliot Smith's theory is to the effect that the ancient Egyptians were the authors of the world's holiolithic culture. He suggests that the civilizations of India, Further Asia, Malay Archipelago, Oceania and America owed the essential elements of their culture (which he calls haliolithic) to the migrations of the Egyptian mariners. He believes that the culture spread by these mariners was a blend of the cultures of Egypt, Phoenicia, Eastern Mediterranean, East Africa, Soudan, Arabia and Babylonia; that Indian influences in turn affected the civilizations of Burma, Indonesia, the Eastern littoral of Asia and Oceania; and that the complex stream of culture which thus arose in Indonesia, Polynesia, Melanesia, China and Japan, in turn played on the Pacific littoral of America, and planted the germs of the pre-Columbian civilization. The eminent scholar gives, as proofs of this extensive travel of culture, the existence of numerous 'extra-ordinary practices and fantastic beliefs' all along the sea-board peoples from the East Mediterranean to America. It is not necessary to enumerate these practices and beliefs at present. We shall have occasion to refer to them in detail later on. Here it is enough to say that Prof. Elliot smith's view is supported by Prof. Perry, who also traces all civilization to Egypt and who holds that even the culture of the Sumeria and Elam was Egyptian in origin.

These views seem to be open to some serious doubts. In the first place the chronology on which they are based seems to be shaky. Prof. E. Smith assigns it to from 3000 to 800 B.C. and Prof. Perry to about 2600 B.C. While it cannot be perhaps denied that the influence of the Egypt of the 21st dynasty and after was felt in the eastern seas and lands and that the expansion of commerce after 800 B.C. between India and at least Babylonia is consistent with the latest conclusions of Dr. Kennedy, it is still very doubtful whether we can attribute such a late and *definite* period as 800 B.C. for this heliolithic cultural expansion. Even Prof. Perry's date seems to err on the side of lateness. Secondly, there is the question put by Mr. F. J. Richards: "Is it possible for the migrations of a few mariners to affect the customs of indigenous people as deeply and minutely as the evidence indicates?" Mr. Richards therefore believes that the influence was too universal and many-sided, too complex, profound and intensely domestic, to be regarded as due to mere cultural drift at the instance of a few mariners. He regards the whole as the evidence of a *racial* drift, and a drift not by sea alone but by land; and concludes that this should date back not merely to 800 B.C. but possibly right away to the middle of the neolithic age when he believes the taste for constructing stone monuments first made its appearance in the Mediterranean area.

THE MEDITERRANEAN RACE THEORY

The fact is, there has been of late a tendency to connect the 'Dravidians' not with the Egyptians alone but with the Mediterrenean race[1] in the general. It is well known that, according to Ripley, Europe is occupied by three ethnic stocks. The first of these is the dolico-cephalic, Mediterranean race in South Europe, which extends also across the Mediterranean into North Africa and across the southern half of Asia-Minor} and the plateaus of Iran and Afghanistan to the major portion of India. The Nordic race of Scandinavia, West Germany, Holland, Belgium and West France is only a projection of this dolico-cephalic stock, being fairer and taller on account of the acclimitization in colder climes. Immediately along the northern fringe of this long-headed stock which extends from Britain and Scandinavia to the Madras Presidency, points out Ripley, there is the second ethnic stock, which is medium-headed; and *after* it, there is the third ethnic stock consisting of a set of broad-headed or brachy-cephalic peoples. The brachy-cephaly in Europe is of quite a different character from that in Asia. The former which comes into contact with the dolico-cephalic or meso-cephalic peoples in North Italy, Eastern France, and Central Germany, occupies the main portion of Europe till, in the confines of Russia, it coalesces into the Mongolian brachy-cephaly. The European or Alpine brachy-cephaly has also spent spurs, like the dolico-cephalic stock, across the plateaus of Asia-Minor and North Persia to Afghanistan, Baluchistan, Central Asia and, we may add, Western India and Bengal. Now it is the contention of Mr. Richards that the Dravidians were identical with the Mediterranean race which formed the ethnic basis of the major portion of civilized Europe and which included the ancient Egyptians, Berbers, Cretans, and the people of Mesopotamia. Hamites, Semites and Egyptians, the authors of the two great civilizations of Egypt and Mesopotamia, belonged thus to the same human stock as the Dravidians. Heliolithic culture was due to " the continuous expansion of the Mediterranean race, not necessarily by sea only, but perhaps also by land, and dating back . . . possibly right away to the middle of the neolithic age, when the taste for constructing stone monuments first made its appearance in the Mediterranean area." Later on he observes " The resemblances between Dravidian India and the Mediterranean area are too numerous and essential to be ignored. I think Professor Elliot Smith will prove a good deal more than he intended to prove; the evidence he adduces points to the identity of the Dravidians with the Mediterranean race." Dr. Slater also believes that a branch of the Mediterranean race passed through Mesopotamia and Baluchistan to India long before the dawn of the Sumerian civilization and evolved the Dravidian race and culture in the new environment, though not without extraneous influences.

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[1] Perry : *Children of the sun.* Elliot Smith : *Migration of the Early culture.*

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See end of Chapter V

CHAPTER V

TRANSITION TO THE NEOLITHIC AGE
ETHNOLOGICAL BASIS—(*Continued*)

It may be mentioned here, for the sake of continuity, that ethnologically there is no perceptible difference between the 'Aryans' and the 'Dravidians.' Both are dolico-cephalic, prominent-nosed, high-featured oval-faced, and curly-haired. The only differences are the comparative tallness and fairness of the 'Aryans' both of which can be attributed to different environment. On this ground and at the same time on the alleged differences of a radical character between the Vedic and the later Hindu religions, Mr. F. J. Richards regards the 'Aryans' of the Vedic civilization to be ethnologically the same as the 'Dravidians,' but belonging to the Nordic type and not to the Mediterranean proper. He sees in the comparative fairness of the Aryan complexion and the differences in Aryan culture and creed a proof of the immigration of a section of the Nordic race, millenniums after the Mediterraneans proper came to India and settled as 'Dravidians.' He proves his theory on the analogy of the relation between the Mycenean and later civilizations of the east Mediterranean littoral. Lastly Mr. Richards attributes the brachycephaly of West India to the probable immigration of the Alpine race or a brachycephalic variety of the Nordic type.[1]

The conclusion must be now clear that the vast majority of scholars are of the opinion that the Dravidians were not autochthons; that they were immigrants into the land some time about the close of the palaeolithic and the commencement of the neolithic era.

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[1] The opinion of W. Crooke that the Dravidians come from Africa is not accepted by many, Sir J. F., Hewitt's amazing details of Tuteranian theory are referred to in a later chapter—the one dealing with the civilization of the Indus valley.

This conclusion is at variance with the conclusion of a few ethnologists, anthropologists and even linguists, not to speak of a set of Indian writers who seem to think that the theory of immigration from other parts of the world into India is by itself a humiliating thing and therefore should not be accepted. With regard to the last set it is enough to say that that should hardly be the attitude of seekers of truth. The history of the world, it should be remembered, has been nothing else than that of the movements and negotiations of plants, animals and cultures as between its different parts; that no culture has been entirely isolated and independent; and that, in any case, in the early history of the world the movement of mankind was not in the form of a politically superior race conquering and super-imposing itself on another but the slow, gradual, imperceptible and massy movement which seemed to be no movement at all. All early mankind developed through these inter-migrations and inter-changes of thought, culture and civilization. The immigration of the Dravidians into India during the general expansion of the Mediterranean race would mean no humiliation to India. On the contrary it would connect the Dravidian race with all those races which have played a part in the history of the world.

But apart from sentiment, the researches of ethnologists and anthropologists are totally against the theory of the identification of the Dravidians with those peoples of India who had preceded them. Years ago, it is true, Sir Herbert Risley maintained such a view of identity. He divided the races of India into seven divisions[1] or types. Coming from the south, these types are:—

(I) The Dravidian, chiefly in the peninsular region. Risley described these as short or shortish in stature; dark, often black in complexion; as possessing hair plentiful and with occasional tendency to curl; as dark-eyed, long-headed and broad-nosed, the nose being often depressed at the root but not so depressed as to make the face flat. Risley took these to be the original aboriginal inhabitants. According to him the Dravidians, though afterwards subjected to Aryan, Scythian and Mongoloid influences, were aboriginal in origin, and formed the original peoples of India.

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[1] See Risley's *People of India* (a reprint from the Census Report of 1901). For an excellent summary of it see *Imperial Gazr.* Vol. I.

(2) The Indo-Aryan type, found chiefly in Kashmir, the Punjab and Rajputana. Risley described these as tall; fair; dark-eyed; hairy-faced; long-headed; narrow-nosed and prominent-nosed though not specially long-nosed. The earliest strata of the type were Aryan. Risley believes that they apparently invaded in five groups and that later on the type was modified by other invaders.

(3) Turko-Iranian type in the North-West Province, Baluchistan, West Punjab and Sindh. This type, says Risley, was the result of the inter-mixture of Indian Aryans, Persian Aryans and Mongolo-Altaic peoples from Turkistan.

(4) Scytho-Dravidian type, of East Sindh, Gujerat and Bombay Presidency. Risley points out that this type was differentiated from the Turko-Iranian by a lower stature, greater length of head, higher nasal index, shorter and narrower nose; that the Mahrattas represent this type best; and that they come midway between the broad-headed Turko-Iranian and the long-headed Dravidian. Contributions to the type, says Risley, were made by races from pre-historic times, but mainly by the various races who invaded India in times subsequent to Alexander.

(5) The Aryo-Dravidian type of the East Panjab, United Provinces and Behar, that is, of Hindustan. These have been described as long and often medium-headed; lightish-brown, often dark in complexion; medium-nosed, with a nose broader than among Indo-Aryans; stature lower than that of the latter and rather below the average. A sudden break instead of gradual transition from the Indo-Aryan to the Aryo-Dravidian type has given rise to the theory of two Aryan invasions, but this is disputed by others. The Aryo-Dravidian country between the upper Ganges and the Jumna is rightly regarded as the most important politically, ethnographically and culturally as it was there that the mixed civilization of Brahminism was evolved and developed.

(6) The Mongoloid type of Burma, Assam and the sub-Himalayan tracts of Bhutan, Nepal and the extreme northern fringe of the United Provinces, Punjab and Kashmir. This type is broad-headed, dark and yellow-tinged, scanty-haired in chin; short-statured; broad-nosed; flat-faced and oblique-eyed.

(7) The Mongolo-Dravidian, in Bengal and Orissa. Risley describes this type as broad-headed; dark; possessing plentiful hair on face; medium-statured; and medium-nosed, with a tendency to be broad-nosed. The type is a blend of Dravidian, Mongoloid and, in the higher groups, of Indo-Aryan blood. It is divided from the Aryo-Dravidian area west of Bihar, and from the Dravidians proper in the north-eastern end of the Deccan plateau where, in Santal and Chota-Nagpur, the hills and forests are occupied by some tribes speaking the oldest language known in India, namely the Munda, which, like the Mon-khmer languages of Assam and Burma, belongs to the Austric family which spreads from India across New Zealand to South America on the one hand and the Madagascar on the other.

CRITICISM OF RISLEY'S THEORY

Risley's view in short is that the whole of India was originally occupied by a race of people called the Dravidians, and that, as the result of the later migration and inter-mixtures, India came to have the seven distinct ethnological groups of the Aryan, the Scythian, the Dravidian, the Aryo-Dravidian, the Scytho-Dravidian, the Mongoloid and the Mongolo-Dravidian. The key to his whole theory is found in his assumption of the Dravidians as the aboriginal race. While he acknowledged that there are other pure populations (the Aryans, Scythians and Mongoloids), he contended that the majority of the Indian peoples have been evolved from the fusion of these in different degrees with the Dravidian race. He did not believe that there were earlier people in India than the Dravidians. He clubbed even the primitive hill-tribes of South India and the Santal country with the Dravidians and regarded them as ethnically identical. He described all of them as short, dark or blackish, dark-eyed, long-headed and broad-nosed. He regarded all of them as professing the same animistic religion, as belonging to the same linguistic groups, as having erected the same stone-monuments and possessed the same totemistic systems, characteristic of " the earliest inhabitants of India of whom we have any knowledge."

The theory that the Dravidians were the earliest inhabitants of India was held by other writers both before and after Risley: Dr. Macleane, the compiler of the *Madras Manual of Administration*, for example, has been already referred to. Bishop Caldwell, again, who, as we have seen already, has his own theory of Dravidian immigration from outside India, still regards all non-Aryan Indians as ethnically homogeneous. The lowest castes, including the Parayas and the jungle-tribes, were, according to him, Dravidians, reduced, in the course of ages, to serfdom. Of late, scholars like P. T. Srinivasa Aiyangar have strongly ranged themselves on this side.

Admirable as Risley's methods of investigation were, his conclusions have been subjected to considerable revision in the light of later anthropological evidences gathered since he wrote his *Report*. Modern scholars are distinctly of the opinion that anthropological data give a clue to the existence of a pre-Dravidian, aboriginal, element in India; and that Risley did not distinguish these pre-Dravidians from the Dravidians on account of his assumption that all had the same physical features, customs and cultures. Again, Risley's theory in regard to the Scythians is vague and has been superseded by a more critical study of the brachycephals of north-west and west India. Similarly, Risley's inclusion of the Bengalis under the Mongoloid type is regarded untenable for the reason that, though the Bengalis are broad-headed, they do not possess the other and more distinctive of the Mongolian features. The deposition of the Dravidians from the position assigned to them by Risley and the necessity to give up his view in regard to the Scythians and the Bengal Mongoloids, logically necessitate the disbelief in the various mixed groups which he so ingeniously and lucidly formulated. The fact is, new anthropological data seem to even strike at the old time-honoured, and almost axiomatic theory of an Aryan race distinct from the Dravidian, thus necessitating a thorough reconstruction of Indian ethnological history. In order to understand this, it is necessary to analyse the data which have of late become accessible to the historian.

THE DIFFERENT ETHNOLOGICAL GROUPS

Now, beginning[1] our study from the north-west, the first thing we have to note is that the whole region which extends from Peshawar to the Pamirs and which is inhabited by a number of hill-tribes (Kaffirs, Chitralis, Nagyas, Balkis and Dards of North Kashmir), presents a homogeneous physical type signalised by a high fore-head, prominent well-cut features and tall stature. This type is also pre-eminent in Kashmir, the Punjab and Rajputana. The Afghans belong to the same race but, for obvious reasons, are lighter in complexion. The interesting fact to be noticed in regard to this race is that its features are exactly like those of the pre-historic skulls discovered at Sialkot and Nal. It is clear from this that, though the Punjab and Indus valley have been subject to numerous invasions and settlements, the ethnological aspect has not altered from pre-historic times. It also shows that ethnically there is no difference between the Hindus and the Mahomedans. The apparent differences in their appearance are due to the different modes of dress, ideals, thoughts and habits of life. The theory of a separate racial origin for the Mahomedan invaders, which has long held the field, thus falls to the ground. It may be also noticed that the rosy complexion and the light eye of the least altered section of this race are occasionally seen, as evident intruders,in the north Indian plain as well as in the south ; for example, the Chitpavans of Bombay and the Aiyangars of Madras. The tall, fair, dolico-cephals of the Punjab and Rajputana extend till the eastern half of the United Provinces, where they come into touch with, and gradually merge into, the Mongoloid element.

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[1] C. F. Guha in the *Modern Review* for November 1926, for whom I am indebted for the above analysis.

Immediately to the north and west of the area of this tall and long-headed race there is a belt of a slightly less tall and rounder-headed race. It extends from Samarkand to Chinese-Turkistan and projects southward, across the Hindu-kush, into western Afghanistan and the whole of Baluchistan. The Baluchis, the so-called Pathan tribes of the neighbourhood, and the Dravidian-speaking Brahui belong to this type, though the southern sections are darker or browner in colour than the original, northern sections This type is not the same as that which has been generally known as 'Turko-Iranian'. The latter is an intrusion due to Islam and therefore of comparatively late date. Further, it has not penetrated the Punjab or Kashmir. The origin of the earlier brachy-cephalic race will be presently discussed.

Besides these two races, there is a third ethnic type which has some connection with the north-west, but which has a more pronounced connection with the north and north-east of India. This is purely Mongolian. It extends from Kashgir north of the Pamirs, through Yarkand, to Khotan and has penetrated southward into the country of the Ladakis and Kulus and eastward along the plateaus on both sides of the Himalayas. This race has a round head, a broad flat face and nose, and slanting eyes. The same race has advanced, from the side of Tibet and China, in historic times, through mountain passes and river-valleys of the north-east into the Brahmaputra basin on the one hand and Burma and Further India on the other. The Indian and western section of this Mongolian race has undergone radical alterations in coming to possess a long head instead of a broad one ; but they have retained the Mongolian features in regard to the nose, face, stature, eye and hair. The people of South Burma and of the hills to the east, on the contrary, have retained even the Mongolian head.

A fourth ethnic group in Hindustan is afforded by the people of Bengal. On the ground that these are brachycephalic, Risley connected them with the Mongoloids. But there are some serious objections to this. The Mongoloid tribes of the Brahmaputra valley are, as has been already said, long-headed, and cannot therefore account for brachycephaly in Bengal. Further, the Bengalis have not got the Mongolian features of the flat face, broad nose and folded eyes. On the contrary, they have a long clear-cut nose, prominent features, and a highly developed pilosity. For these reasons, Risley's theory of a Mongoloid origin for the Bengalis has to be given up. The brachy-cephaly of Bengal in fact has some resemblance to the brachycephaly of Western India, of the region which extends from Gujerat to Goa, which includes the Koorgs, the Kanarese and the Telugu-speaking peoples of Mysore, Bellary and Karnul (up to longitude 38 east). The identity of many surnames among the Nagar Brahmans of Gujerat and the Kayastas of Bengal seem to be a corroboration of the connection. In Bengal, the brachy-cephals mixed with the Mongoloids in the north-east and the dolico-cephalic peoples of the west. Similarly, in western India the brachy-cephals mingled with a long-headed but flat-nosed non-Mongolian race who had occupied the whole of South India before their invasion and settlement. These broad-headed people again must not be confounded with the Turko-Iranian broad-headed peoples who have been already referred to and who came subsequent to Islam. The broad-headedness of Gujerat, Western India and Bengal was probably due to the intrusion of the Alpine race in pre-historic times, long before the broad-headed Scythians or Turko-Iranians came in the train of Islam.

It will be seen from this that there are at least six different races in North India. First there is the tall, fair-skinned, prominent-nosed, handsome, long-headed group of the Punjab, Rajputana and Kashmir, both Hindus and Mahomedans belonging to it. This corresponds to the Aryan type of Risley. Secondly, there is a modified type of this to the further east as well as the western parts of the United Provinces. Thirdly, Bengal is occupied by a race which is broad-headed but with facial, nasal and other features of the long-headed race of the north-west and west. Fourthly the north-eastern parts of Hindustan are occupied by the Mongoloids who are broad-headed and who have nasal and facial features different from those of the broad-headed people of Bengal and the long-headed people of the interior. Fifthly, there is a broad-headed people from the Pamirs across west Afghanistan to the Baluchistan border as a result of later Islam. Lastly, we find naturally mixed and transitional types in the area covered by the eastern parts of the United Provinces and western Bengal. Thus, as we come from the extreme west, we have first a brachy-cephalic region, then a purely dolico-cephalic region, then a mixed area, and then different kinds of brachy-cephalic areas.

Such are the ethnological groups in Hindustan. It will be seen from this description that Risley's theory stands almost intact in regard to the Aryan race of the Punjab and Rajputana. His 'Aryo-Dravidian' type also still stands though, as I shall show later on, there are some scholars who are not for ethnically distinguishing the Dravidians from the Aryans. The discovery of the Byana skull in the United Provinces shows a mixture of culture, if not of two races. But with regard to the brachy-cephaly Bengal and Bombay, modern scholars differ entirely from Risley. He regarded the former as Mongoloid and latter as Scythian. It is now held that they were probably the descendants of the Alpine race. It is very probable that this race was connected with the men of Indus Civilization, about whom a large number of archæological discoveries have been made of late; but we cannot be positive about this as the Sindh discoveries have revealed only one brachy-cephalic example as against many dolico-cephalic ones.

We have thus far dealt with the ethnology of Hindustan. We shall now pass on to the Dakkan and South India and see how far Risley's theory can be accepted. We have already referred to the fact that from Gujerat to Goa there is a fairly broad-headed race which Risley regarded as Scytho-Dravidian but which we have surmised to be Alpine or rather a mixture of the Alpine and a dolico-cephalic people who had been in the country before the Alpines came and who may be identified with the pre-Dravidians or Dravidians. The brachy-cephalic predominance in the West Dakkan is proved in a lucid manner by the researches of Mr. F. J. Richards I.C.S.[1] Taking the possibilities of the cranial variation of the peoples of the south as long, longish, roundish, round and ultra-round, as it is respectively between 70 and 72·5, 72·5 and 75, 75 and 77·5, 77·5 and 80, and 80 to 82·5, we can construct this table in regard to the South Indian peoples.

Tribes.	Ultralong 70—72·5.	Long 72·5—75.	Longish 75—77·5.	Roundish 72·5—80.	Round 80—81·5.
Tamil Malayalam Brahmans.		—	—		
Kanarese Tulu Brahmans.				—	—
Jungle-folks		—	—		
Malayala (Non-B.) ...		—	—		
Tamil (Non-B.) ...		—	—		
Telugu (Non-B.) ...			—	—	—
Kanarese (Non-B.) ...			—	—	—
Tulu (Non-B.) ...				—	—

This diagram obviously shows that all the peoples of southern India, the Brahmans, the jungle folks of the south, the Malayali and the Tamil non-Brahmans, must be classed as one distinct type, the type of longish-headedness, and that the more northern Telugu and Kanarese peoples are primarily roundish-headed, though some are longish-headed and some positively round-headed. The diagram, in other words, seems to suggest homogeneity among all the castes, Brahmanical and non-Brahmanical, in the Telugu-Kanarese area and homogeneity among all the communities of the Tamil-Malayalam region. It seems to cut across, as we shall presently see, the lessons of stature and nasal index. But this apparent inconsistency of the cranial indices is easily explicable. The whole of the Dakkan and the Maharashtra became subject, as we have already seen, to a round-headed Alpine race' of which the Bengalis, might have been an off-shoot. The later 'Scythians' also might have been to some extent responsible.

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[1] In the *Journal of the Mythic Society* for 1919. The ethnological data have been taken from Thurston's *Castes and Tribes*, Vol. I. The opinions of Flower, Lydekker, Topinard, Huxley, Seman, Keane, Qatre-fages, etc., are all referred to in detail in the latter work. The cranial index in Hindustan is excellently summarised in *Impl. Gazr.* Vol. I, pp. 288—9.

Passing on to the further south of the peninsula, even a superficial observer can see that there are three distinct elements in the population. First, there are the Brahmanical communities[1], comparatively fair in complexion, tall in stature, long-nosed, high-nosed, small-lipped and with a smooth, flowing pilosity. Then there are the typical non-Brahmanical communities with slightly darker or browner complexion, a shorter stature (generally speaking), a mesorrhine nose (70 to 85) which occasionally tends to become broadish, a comparatively receding forehead, a distinct odour, and distinct mental and moral habits sometimes radically differ from those of the first class. But on the whole both are physically alike and dolico-cephalic. The differences of complexion can be easily explained on various grounds and need not show racial difference. Thirdly come the exceedingly short, dark (sometimes black) primitive men like the Kadirs, Panans and Irulas of the mountains and the Kurumbas of the plains, with their flat and platyrrhine (above 85) nose, their thick lips and their wild and matted, though not woolly, hair. In head form these jungle folks do not show much difference from the other two divisions; but their dolico-cephaly is more primitive as the vault is too low and the direction of the brain backward. They also occasionally show a prognathous face though they are as a rule, orthognathous like to others. In their very short stature, low forehead, flat nose and dark complexion many scholars see evidences of a distinct race.

These three distinct groups have been generally taken to be the Aryans, the Dravidians and the pre-Dravidians. The differences in head form are not very great amongst these three groups; but in the stature and the nasal index they are very perceptible. Dividing,[1] like Mr. Richards, the people into the five divisions of ultra-short, short, shortish, tallish and tall, we can construct, out of the valuable data furnished by Thurston and Rangachari. This table:—

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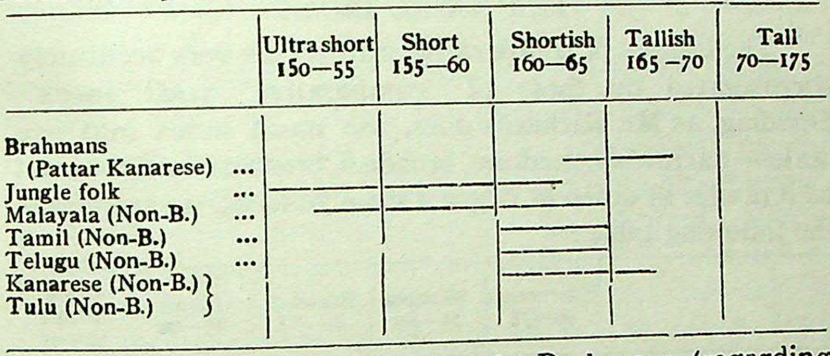
[1] Mr. J. C. Nesfield, in his *Brief view of the caste system of the N.W. Provinces and Oudh,* questions the existence of differences between Brahmans and others in complexion and features. He is positively incorrect so far as South India is concerned.



It will be seen from this that the Brahmans (regarding whom, however, the evidences are unfortunately incomplete) are uniformly shortish or tallish, but never short. The jungle tribes, eleven of whom were examined, form the shortest group. They will be seen to be much shorter if we exclude the Chenchus and Malasars who have 162·5 and 161·5 cm. respectively and consider the other nine only; for the range will then be only between 150·1 and 159·8 cm. This shortness of the forest tribes is unique: no plain communities resemble them in this respect except three out of seven communities in Malabar (alone). The four other communities of Malabar and all the communities of the Tamil, Telugu, Kanarese and Tulu lands are, on the whole shortish, ranging in stature from 160 to 165 cm. A very few people in Malabar, two out of ten communities in the Tamil country, one out of 13 communities among the Telugus and 7 out of 15 communities among the Kanarese are above 165 cm. in height, though only slightly so. One conclusion alone is possible from these data; namely, that the jungle folks form a distinct community; the Brahmans form another; and the non-Brahman. Dravidian-speaking peoples form an intermediate group, a small proportion resembling the Brahmanical class and a larger proportion resembling the latter among the jungle tribes. In Malabar there is a larger streak of shortness indicating a substantial social approach towards the mountain tribes.

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[1] The divisions of this analysis are adapted from those of F. J. Richards's contribution on the Dravidian ethnology in the *Journal of the Mythic Society* for 1919.

THE NASAL INDEX

The lessons of comparative stature are very accurately corroborated by those of comparative nasal index.[1] Dividing, as Mr. Richards does, the nasal index into five scales—narrowish, medium, broadish, broad and ultra-broad as it ranges in different degrees from 70 to 95, we can frame the following table :—

	Narrowish 70—75	Medium 75—80	Broadish 80—85	Broad 85—90	Ultra broad 90—95
Brahmans (Pattar and Kanarese)...	——	——			
Jungle folk ...			——	——	——
Malayala (Non-B.) ...	——	——	——		
Tamil (Non-B.) ...	——	——	——		
Telugu (Non-B.) ...	— —	——	——		
Kanarese (Non-B.) ...	– ——	——			
Tulu (Non-B.) ...	——				

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[1] "Recently," says Mr. B. Guha, "Mr. Dudley Buxton of Oxford has tried to demonstrate that in India there is a correlation between climate and nose-form; cold and dry climate tending to produce broad thick noses,—it being even possible to predict the nose-form as a particular people living in a particular locality: . . . Unfortunately, when tested, the results calculated from Mr. Buxton's formula do not agree with actual facts," Mr. Guha proves this from a number of Baluchi tribes. Further, he points out, "a little inquiry in the nasal characters of the Indian race shows the conditions in India to be almost the reverse of what Mr. Buxton supposes them to be. For, the most platyrrhine peoples in India are invariably those that have been living in the colder and comparatively drier climates of the hills, e.g., the Kanets of Lahoul, the Bhutanese of the Bhutan mountain, the Garos of Assam, the Palaungs and Was of Burma, and the Kadirs and other tribes of the South Indian hills to name only a few. And on the other hand, it is in the hot and humid climates of Bengal and Malabar that we find the most Leptorhine peoples in India." (*Modern Review*, November 1926, pp. 526-7). But the nasal index has proved a valuable social test in India. See *Impl. Gazr.*, I, pp. 290—1. Even ancient Indians recognized the value of this test if we are to judge from the contemptuous tone with which the Vedic people speak of the 'noseless' (*anasa*) people. It should be recognized, however, that the term *anasa* has been interpreted, not as' *noseless*, but' incapable of talking Sanskrit.' See chap. VI below

This table shows that the Brahmans (regarding whom, again, the data are unfortunately incomplete) have got a narrowish or a medium nose which ranges from 71·2 to 76·5. The vast majority of the non-Brahmanical classes are on the contrary medium-nosed, and even slightly broadish-nosed, though they are never, as Risley wrongly says, broad-nosed. Eight of the 14 Tamil castes, 4 out of 7 Malayala ones, 6 out of 13 Telugu, and 2 out of 15 Kanarese castes, have got a nasal index above the largest of the Brahmanical index; and of these, 3 Tamilian castes, 2 Malayala and one Telugu are distinctly broadish-nosed, with the maximum index of 81·5. The jungle-folks, on the contrary, are uniformly broadish, broad or ultra-broad-nosed, their nasal index never falling below 80. A small margin of resemblance between the 5 broadish-nosed communities mentioned above and the jungle folks exists; but this is practically negligible as 10 out of the 11 forest folks examined have got a bigger index than 81.5. The conclusion then is obvious that from the standpoint of the nasal index, the Brahman, the non-Brahman and the jungle tribesman form three distinct ethnological groups, the second of these sharing, in different degrees in the different sub-castes, the feature of either of the extreme ethnic types. It must now be obvious that the theory that the Dravidians and the aborigines were one should be given up. The hill-tribes form a distinct race by themselves and must have been pre-Dravidian.

This conclusion naturally raises the question whether the Mundas mis-called Kolarian) and other allied tribes of Central India were, as Risley believed, ethnically identical with the Dravidians[1]. The theory of identity is based on the supposed physical resemblance of the two groups. Both are, it is said, comparatively short in stature, longish-headed, dark-skinned, dark-haired and dark-eyed. There are also said to be close affinities between the Munda and the Dravidian tongues. Other scholars on the contrary believe that the two peoples are racially different. They point out that the Kols have a broad nose like the Andamanese and the hill-tribes of South India, while the Dravidians have a narrow nose. Further, the linguistic affinity between Dravidian and Munda, they point out, is questionable. "Whether we consider the phonetic systems, the methods of inflection or the vocabularies", says Dr Grierson, "the Dravidians have no connection with the Munda languages. They differ in their pronunciation, in their modes of indicating gender, in their declensions of nouns, in their method of indicating the relationship of a verb to its projects, in their numerical systems, in their principles of conjugation, in their methods of indicating the negative in their vocabularies." (*Impl. Gazr.*). Dr. Caldwell is of the same opinion. He does not include "the Ho, the Munda or any of the rest of the languages of the Kols, the Savaras and other rude tribes of Central India and Bengal" in the Dravidian group. "These languages" he says, "might naturally be supposed to be allied to Gond or Ku, to Oraon or Rajmahal, and consequently to be of Dravidian origin; but though a few Dravidian words may be perhaps detected in some of them, their grammatical structure shows that they belong to a totally different family of languages. Without the evidence of similarity in grammatical structure, the discovery of a small number of similar words seems to prove only local proximity or an existence of mutual intercourse at an earlier or later period, not the original relationship either of race or languages."

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[1] Further analysed, the theory is to the effect that the Kolarians came by the north-east passes and the Dravidians by the north-west; that they crossed each other in Central India; and that the Dravidians "proved stronger, broke up the Kolarians, thrust aside their fragments to east and west, and then rushed forward as a mighty body to the south. It thus happened that, while the Dravidians formed a vast whole in Southern India, the Kolarians survived only as isolated tribes, scattered so far apart as soon to forget their common origin."

The opinion of Dr. Haddon is that the Munda-speaking peoples were probably an Indonesian race who originally belonged to the valley of the Ganges and western Bengal and who spread from there, after the pre-Dravidian migration, to Further India,[1] to Malaya, to East Indies and to

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[1] "The existing population of the Archipelago, with the exceptions just quoted (*i. e.* Negritos and pre-Dravidians) consists mainly of varying degrees of mixture of dolico-cephalic Indonesians with brachy-cephalic Proto-Malays."

Polynesia, where they afterwards came to be supplanted by the broad-headed proto-Malay stock. "Everywhere they have been more or less modified by the Dravidians, and while scattered relics of the languages are preserved, the original physical type appears to have been assimilated to that of the Dravidians, but perhaps it was originally a closely allied type."

From what has been thus far said it will be obvious that, according to the researches of the latest ethnologists, pre-Aryan India was occupied by (1) the Dravidians, (2) the Mundas who might or might not have been allied to them and (3) the pre-Dravidians or jungle tribes who belonged to an earlier stage of culture than the first two. To these one other pre-historic race has to be added, namely the Negrito, to which reference has been made already. We do not know whether the Negritos ever lived in South India, but opinion seems to favour theory the supposition that it was a widespread race living at present only in the Andaman islands.

One inference which can be made from the foregoing analysis is that, though there was not much distinction between the Aryans and the Dravidians in physical form, still even physically they were not entirely the same and that, at all events, the cultural differences are wide enough to distinguish then entirely. Even if they belonged originally to the same group of humanity, they are sufficiently differentiated in culture and habits to afford justification for holding them as distinct.

This conclusion is justified by the discoveries of anthropology. Anthropology, it is true, has not made much progress in India. Though India was in all probability the home of the earliest man, no human remains of the remotest ages have been discovered. Ethnological study (with which are associated the names of Risley, Col. Havelock Charles, Holland, Samanta, Gupte, Col. Waddell, Thurston, etc.) has been based on the study of the living races,—a difficult thing on account of the number of races and the mixed character of most of them. Still, a few discoveries of ancient human remains have been made; and these seem to indicate the justifiability of the divisions of the Indian peoples culturally at least into the distinct divions of Aryan, Dravidian and mixed. Skulls of ancient man have been discovered in India in four places, *viz.*, Bayana[1] near Agra in the United Provinces; Sialkot in the Punjab; Nal, 250 miles from Quetta in Baluchistan border; and Adichchanallur in Tinnevelly. The first of these was discovered by Mr. Wolff in 1912 on the banks of the Gumbhir river 35 feet below its bed, while engaged in the construction of a bridge. No precise information about the constitution of the deposit in which the skull was imbedded or the nature of the animal bones with which it was associated, is available; and therefore we cannot assign a definite date to this skull; but from the fact that it was found so deep below the surface and from the fact that it was already subject to much mineralisation, it has been suggested that it was of considerable antiquity, in fact, the oldest relic of man thus for discovered in India. The Nal skull which was exhumed by Mr. Hargreaves has been attributed to earlier than the 2nd millennium B. C. The Sialkot cranium was found by Lieut. Hingston in 1912. It probably represented a burial, to judge from the complete nature of the skeleton which was laid on its right side. The skulls exhumed by Mr. Rea at Adichchanallur in 1901-3 were found in large burial turns of an age subsequent to the introduction of iron. These four cranial finds give a clue to the races inhabiting different parts of India from a period beginning with several thousand years before Christ to the early century before Christ. Mr. B. Guha[2] who has made a comparative study of them, points out that (1) all of them are markedly dolico-cephalic; and (2) there are still great differences in their forms and configurations. The Sialkot and Nal skulls indicate a high, uniformly curving brain vault, while the Adichchanallur skulls indicate a low vault as well as a receding forehead, indicating a comparatively backward brain. The Nal cranium again shows a fine, well-developed nasal base and a long, oval face, while the Adichchanallur skulls show broad flat nose and prominent cheek bones. The Bayana skull comes midway between the two in almost all respects. Its vault is not so big as that of the Nal and Sialkot skulls but higher than those of Adichchanallur. In the form of the face and the shape of the nose again it resembles the former. It is clear from this, as Mr. Guha says, that there were three different racial types in India in the pre-historic and proto-historic ages, *viz.*, one throughout north-west India, the second in the heart of Aryavarta and the third in South India. The early South Indian type shows strong affinities with the hill-tribe of the Vedahs as well as the Dravidians. One conclusion alone seems to be possible from these, *viz.*, that there is much justification for the ethnical division of the Indian peoples into the three broad groups usually styled the Aryan, Dravidian, and pre-Dravidian. Human remains later than the Adichchanallur skulls and belonging to the early centuries of the Christian era have been discovered from a site near Ajmere, but these have been lost and a deduction of the ethnological history of the country during the historic periods has to be made entirely on the basis of the present populations.

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[1] The detailed analysis of the Bayana Skull as made by a student of Mr. Panchanan Mitra is given in his *Pre-historic India*

[2] See *Modern Review*, Nov. 1926 pp. 518-27. The opinions of others are referred to in the Bibliographical note.

We may now summarise the ethnological position of India in the beginning of the neolithic age. The Negrito race had practically disappeared. The whole country, that is, the habitable part, was in the possession of the ancestors of those tribes which are at present seen in the mountains and jungles. These have been generally called pre-Dravidian.' The 'Dravidians' or the Mediterraneans migrated into the land some time, we may suppose, about the 9th or 8th Millennium B. C. and after driving the 'pre-Dravidians' and Indonesian Mundas to the hills and woods, occupied the more fertile parts and carried on the neolithic culture. The 'Dravidian' culture spread throughout India during the next four or five millenniums. The pre-Dravidians and 'Kols' who were not driven into the forests and who remained in the plains were probably made slaves. A certain amount of inter-course and blood-mixture must have taken place between the two. This is the probable explanation of the variations and mixed character shewn by the non-Brahmanical classes as against the 'Brahmans' or 'Aryans who belonged to the same original ethnic stock, but who came three or four millenniums later. The difference between the 'Aryans' and 'Dravidians' may be best explained on this hypothesis. The men of the recently discovered civilization of the Indus valley were probably connected both with the earlier and later types of the "Mediterraneans."

We shall pass on in the next chapter to study the neolithic culture.

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Among the early works on the subject may be noticed H. W. Bellew's *Races of Afghanistan* (Calcutta 1880); Oppert's *Original Inhabitants* of *Bharatavarsha* which first appeared in the *Madras Journal of Literature and Science* (1893); Risley's *Tribes and Castes of Bengal* (1891-2); W. Crooke's *Tribes and Castes of North West Provinces and Oudh* (*1896*); Rice's *Mysore* (1897); Rice's *Mysore and Coorg from the inscription* (1909); Kennedy on the *Early Commerce of Babylon with India* (J.R.A.S. 1898); River's *The Todas* (1906); Thurston and Rangachari's *Castes and Tribes of Southern India* (1909-10); Dr. Macleane's *Madras manual*, Vol I; M. Srinivasa Aiyangar's *Tamil studies*; Anderson's *Peoples of India* (1913); Baines's *Ethnography* (Strassburg, 1912); Holderness' *Peoples and Problems of India* (1912); Ramaprasad Chanda's *Indo-Aryan Races* (1916); Risley's *The People of India* (1915 2nd Edn.); F. J. Richard's *some Dravidian affinities and their sequel* in the *Journal* of the *Mythic Society*. (1919) and Slater's *Dravidian Elements in Indian Culture* (1924) .The Cambridge Manuals of the different Provinces are of high value. The references to the migrations of the different races are to Dr. Haddon's *Races of Man*, *Study of Man*, and the *Wanderings of Peoples*. S. Panchanan Mitra's *Pre-historic India* and B. Guha's article in *Modern Review*, (Nov. 1926) have already been referred to.

CHAPTER VI

THE NEOLITHIC AGE

We have seen how, at the close of the glacial and palaeolithic ages, there was, in every part of the world, a gradual transition to the neolithic age, when man still depended on stone implements, but made very beautiful and skilled varieties of them, and at the same time laid the foundations of human civilization. We shall proceed in this chapter to trace, as briefly as possible, the progress made by man in this period. We shall study the fundamental features of the neolithic age in general and see how far Indian conditions fitted in with them and what place India occupied in the development of human culture and progress.

GENERAL FEATURES

The first and foremost point to be noted in regard to the neolithic remains in general is that they have invariably been found not in ancient river gravels or caves but on the surface of the earth or in very slight depths. These remains are generally in the form of rubbish-heaps, pile-dwellings, tumuli and burying places, all of which have revealed a highly variegated set of skilled and polished stone implements. The most characteristic of the neolithian remains in the west are the '*kitchen middens*' invariably found in the sea-shore. These are 'special workshops' which are believed to have come into existence as the result of the growth in the demand for the stone tools among the growing numbers of men and the growing division of labour between the makers of implements and the ,users of them. These work-shops, are the refuse heaps which show, by their character, that they must have been the sites of extensive hunting and fishing camps and settlements. The neolithic men were apparently wanderers in search of sites suitable for the chase and for fishing, the two chief occupations to which they were addicted. The neolithians who had sufficient forests, water and other facilities, might have been stationary! but as it was difficult for many communities to command the game and the fish they needed in a single area, they had to wander, particularly along the coasts, and settle in suitable places. The remains of such settlements or 'kitchen middens' are found in various parts of the world like the coast of Denmark, South America, Australia. Some of these mounds are thousands of feet long. They contain castaway things like shells, bones of the deer and the dog, the duck, the swan, the cod, herring and other kinds of fish. All the marrow-yielding bones are found split open. Further there have been found in these ruins numerous implements of stone, bone and wood together with old rude pottery, charred wood and sea-plant of a salt-yielding capacity. From the fact that the kitchen-middens contain the bones of the dog and no other domestic animals, it has been inferred that the dog was the earliest animal to be domesticated. As the bones of the fish indicate their catch in the deep seas it has been inferred that the neolithians were great fishers in the wide seas, for which purpose they used small dug-outs fitted with net of twisted bark and fibrous plants. That voyages hundreds of miles off are possible with these frail scooped pieces of wood is demonstrated by the activities of numerous communities in all stages of history. India is not unaware of them even in the present day.

Another common feature of the neolithic period was the pile-dwelling. Very often we find the neolithians settled in extensive village houses built on piles planted on the shallow edges of lakes, the platform of the settlement being, as a rule, though not always, connected with land proper by a causeway. The settlements are sometimes very extensive containing at times more than 200 huts raised over forty or fifty thousand piles, which means an extraordinary industry for their stone weapons. Such pile-dwellings have been found in Asia Minor, Central Africa, South America, Borneo, Greece, Thrace and various parts of Central and Western Europe. Pile dwellings in coastal Europe and the British Isles survived the neolithic period into the metallic ages. It is in the lakes of Switzerland that the largest number of lake-dwellings have been discovered. The huts in these are either square or oblong and made of wood, twigs and straw, often plastered with mud or clay. Between the dwellings were located the cattle pens, sheep-folds, and pig-sties when these animals came to be domesticated in the course of the neolithic age. The pile-dwellers must often have driven their cattle to the mainland when pastoral life became common among them.

The implements discovered in neolithic sites are the celts (chisels), picks, hand-chisels, guages, perforated axes, adzes, saws, harpoons, grinding-stones, querns, sink-stones, whet-stones, choppers, awls, drills, knives and borers. Amongst the war implements and the implements of the chase occur numerous varieties of javelins, sling-stones, lances and arrow-heads. The implements and other things of this period are not only made in stone but in bone and wood. Among the bone-made things may be mentioned lance-heads, pins and needles. Stag-horn was made into hammers and axes. Human vanity already displayed itself in the neolithic period; for we find the women of the age adorning themselves with things made of jet, shale and amber. The neolithic implements are, to the common peasant-folk of to-day, objects of superstition. Every Hindu knows, for example, the belief that the thunderbolt gives the professional burglar his borer. As a matter of fact this is only a neolithic axe. The theory of the elf-shots in Europe is a closely allied superstition. Neolithic implements are nowadays regarded by the superstitious as possessing magical powers like healing disease, averting evil eye, and so on. In many places therefore they have been either used as charms or as objects of worship. The way side tree-shrines very often found in India have been raised over such finds. No part of the world is free from these superstitions. Modern civilization has not been able to put an end to them and neolithic survivals are very common as much in the most civilized parts of Europe as in the most remote corners of Africa. It is an indication of the universality of the neolithic culture and the mutual kinship of humanity throughout the world.

The neolithians did not only manufacture these implements but have earned the gratitude of later mankind by their discovery of the rudiments of civilization. Though at first hunters they later on discovered the arts of pastoral and settled agricultural life. They also discovered the art of making pottery and living in built houses which were in the form of wattle and wicker-work huts—examples of which survive among the wandering communities of India even to-day. As has been already said, the neolithians also discovered the domestication of animals in which the dog seems to have played the earliest part. Mining, weaving and many other arts which they had the ingenuity to discover have ever been the bottom-rock of human progress. The discovery of metals like gold in the latter part of the neolithic period has led to neolithic settlements near mining areas as near centres of fishery in earlier times. Above all the neolithians contributed to the evolution of human thought, morals and religion.

THE STONE MONUMENTS OF THE NEOLITHIC AGE

The neolithic man did not only take to a settled life, but was the first to conceive the *real* sense of religion. Like his palaeolithic predecessor, he saw everywhere and in everything where there was the least motion, the presence of a spirit. In the very acts of sleeping, moving, walking, falling, dying, his primitive mind saw the promptings of a superhuman agent, a belief which has survived in many of the superstitions of even civilized people. One remarkable way in which this ‘ animism ’ showed itself was in the rise of stone-worship. Peculiar-shaped stones came to be venerated for their fanciful appearance to peculiar things. Another way in which it manifested itself was by the erection of monuments for the memory of the dead. The idea of the neolithic man was that the spirit of the dead should be given a location as in life ; that the chamber of the dead should be a copy of the chamber of the living. The grave was to be the prototype of the home. The practice of constructing sepulchres for the dead came therefore into existence. The neolithic tombs or *tumuli* have been found beneath specially-constructed cairns or earth-mounds in various places. The earth-heaps in Europe are long in shape (hence the name *long barrows*) in the earlier and circular (hence the name *round barrows*) in the later periods. Sometimes we find, either in these barrows (literally, hillocks) or quite separately from them, single stones or *Menhirs* (literally, lofty stones) in commemoration of the dead. Sometimes we find a number of stones, generally three of four, with one super-imposed over the others to form a chamber for the dead, in which the tumuli are located. These are called *dolmens*, from Celtic *dol*, table, and *men*, stone. Sometimes we find huge circles of stones—*cromlechs* literally (circle-stones) as they are called,—enclosing dolmens and barrows, or standing by themselves. The ring of stones apparently represented the fencing of the neolithic huts. These three kinds of stone monuments—menhirs, dolmens and cromlechs—were constructed on account of the primitive belief that, unless the departed spirit had a home and other things as in life, it would hover restless and troublesome around its old abode, doing harm thereby to the living. Some of the European long-galleried *tumuli* are as many as 400 feet long and approached by an underground passage to the sepulchral chamber. The bodies are buried either at full length or in a crouched posture, resting on the haunches as among the ancient Peruvians as well as the modern Andamanese and many Indian communities. It has been suggested that the crouched posture was an imitation of the squatting position in life. The close of the neolithic period saw the introduction of the custom of cremation in place of burial. The ashes were then preserved in a stone cist or urn, and buried with food and drink, celts, flakes, arrow-heads, pottery, etc., so that the departed spirit might command these in the other world. In the British tumuli, there have been found holes in the surface which were originally intended as receptacles for food and drink. One very interesting fact disclosed by the finds of the Dordogne caves is that the dead children are given ivory *dolls*, apparently in imitation of life. There is every reason to believe that the custom of feasting at the grave as a commensal act between the dead and the living came into existence in this age. Cloven skulls of human beings having been found in these tumuli, it has been inferred that there must have been human sacrifices so that the deceased might not perhaps lack attendants. The victims in these .sacrifices were probably slaves taken captive from hostile communities. "Other human beings," says Clod, "point to the sacrifice of wives that they might .join their dead husbands," sati being thus a very ancient custom. Very many of the details in the funeral ceremonials observed by the savage peoples as well as civilized communities show neolithic features in them.

Such are the general features of the neolithic period, as they have been deduced from the evidences of the European and other continental finds. We shall now study how far these features are reproduced in neolithic India. Naturally the first question which suggests itself is whether the Indian neolithic settlements came into existence in the very same environments in which they arose elsewhere, that is, whether there were kitchen-middens near the sea, pile-dwellings on the beds of lakes and megalithic monuments near the mines where from the metals (when their use came into vogue) could be exacted or areas where they could exchange the simple articles of need or value. We have not got many exmples of pile dwellings in India. The lakes suitable for such dwellings are not wanting. Even in the palaeolithic period there were examples of lake settlements south of the Krishna in Mysore and South Bombay. There are bound to be such settlements in the neolithic age of India. But this has to be proved by a systematic search of the shallow waters like Ennore, Pulicat, Kolair, etc. Examples of camp finds near the coast, and near mining areas are very common. The numerous finds of the Tambraparni basin, for example, are in the vicinity of areas famous for pearl and conch fisheries. It is very probable that this region came to be the centre of the neolithic colonisation for the sake of the fish and the valuable ornaments which the neolithians of at least the later days loved. Vincent Smith surmises that the Tinnevelly graves were "probably those of foreign colonists who settled there for trading purposes and continued to reside for centuries." An argument in favour of the theory that the Tinnevelly neolithians were strangers is that cores and flakes worked by them do not indicate an indigenous origin. But the settlers need not, as will be shown presently, have come from other parts of the world, but from the area further north in South India itself. However it might have been, there is no question that the Tinnevelly settlements were very extensive and had a continuous existence for centuries. The graves contain iron and other materials of a later period, but these are over an original substratum of neolithic material. The extension of the sepulchral urns over a wide settlement of more than a hundred acres in one spot seems to indicate this. It is also probable that Maski, the famous centre of gold mining in Hyderabad, the shafts of which are the deepest in the world, and the exploitation of which was busy even in the days of Asoka, was a late neolithic settlement, the result of search for gold, the use of which was earlier than that of iron or copper. It is not improbable that, as Vincent Smith observes, the cairns and cromlechs characteristic of the neolithic period would be discovered near the sites of ancient mines or fisheries. (*Oxford History*, p. 3).

The paramount fact, however, which determined the settlement of the neolithians in particular localities in India was the availability of a particular kind of rock which they chose for making their stone implements with. While the palaeolithians had always used the light-coloured quartzite, the neolithians chose the black-coloured trap which occurs among the ancient gneiss and granite formations and occasionally elsewhere (e. g., in Dharwar, Cuddapah and Karnul) as intruders The trap rock is tougher and more tenacious than quartzite and was more suited for the manufacture of the polished weapons of this age. The habitations of the neolithians were naturally therefore different from those of the palaeolithians. The latter had lived in quartzite areas like the Madras coast and Cuddapah rocks or, where quartzite was not available, in areas (as Bellary and Krishna) where jasper and limestone were available. But the neolithians lived in almost every province of India except south of the Kaveri (where there is no trap at all). In Central India, in the Dakkan (which was the great land of the trap), the Gangetic plain, Bundelkhand, Central Provinces, United Provinces, Assam, the Naga hills, the highlands of Bengal, the outer Himalayas, the Shan States, Burma, Baluchistan and Seistan, the neolithic remains have been found. In Rajputana, Sindh, the Punjab and Bombay the search for them has not been systematically made; but it is believed that, when this is done, the remains of this period may be found there also. Neolithic India was much more thickly and widely populated than palaeolithic India. The efficiency of the neolithic implements and the wider distribution of the raw material led to the occupation of many areas not tenanted by the palaeolithians.

While the trap rock was used for making the ordinary implements of war and peace (like celts, adzes, chisels, scrapers, etc.) the neolithians used other materials for making domestic things like hammer-stones, mealing-stones and corn-crushers. These were varieties of granite, gneiss, jasper, grit-stones, lime-stone and other 'trappoids'. For small and delicate tools, again, they made use of chert, agate, chalcedony, bloodstone, rock-crystal, and other beautiful materials. Cores and flakes of these have been discovered plentifully. If quartzite was used at all, it was only for such flakes and scrapers as were more serviceable as unworked, rather than polished, things.

NEOLITHIC SITES IN INDIA

A detailed and systematic survey of the neolithic sites would show this. Beginning from the extreme south of the peninsula, we find that Travancore and the extreme south had no neolithian settlements for the same reason that they had no palaeolithic ones. Funeral urns and fabric-marked pottery have been found in Travancore but these are believed to belong to later times. In the district of Tinnevelly neolithic scrapers of basalt, cores and flakes of chert, silicified wood and quartz have been found at Sawyerpuram and elsewhere; but as all these are not indigenous to the district it has been inferred that they were exotic and imported by colonists from the north. The Tinnevelly cores are sometimes less than an inch long and very shapely in form. A pair of angular sling-stones discovered in the district have been compared to the English model and an arrow-head (the only stone arrow-head discovered in India) has been compared to those discovered in the caves of France. In Madura district also the neolithic mace-head of gneiss, scrapers of chert, have been discovered indicating migration of the folk from the north; for these materials are not indigenous to that district. A bone pendant discovered at Valimukham Bay, a number of buried urns and *menhirs* near Manamadurai, a number of *dolmens* in the Palni hills and of *cairns* (with red and black pottery) near Kodaikanal, as well as a number of Kurumbar rings in the district are believed to indicate neolithic settlements in the district. No neoliths have been found in Tanjore or Trichinopoly, though in the latter district, the raw materials for the artifacts of the age are not wanting. Salem District, on the contrary, is rich in neoliths. The Shevaroy hills were a very extensive neolithic settlement. Artifacts were brought to light in these hills as early as 1865. Even to-day neolithic celts are ploughed up in the fields of this region as well as other parts of the district by cultivators. Regarded by the simple peasant-folk (as in other parts of the world) as thunderbolts, these weapons, are made objects of worship in local shrines or at the feet of sacred trees. From the extremely clumsy character of the trap implements discovered at Bargour in Krishnagiri Taluk it has been suggested that the earliest of the new stone-men might have lived in this region. The Shevaroy hills have revealed many kinds of celts; a ring-stone with a central hole of two inches; slick-stones for polishing (which indicates the discovery of the art of weaving); a *linga* in "pale gneiss diminishing triconically and truncated with flat ends" and earthenware *phalli* which prove the antiquity of phallic worship; and pottery in the form of discs, sprouted *lotahs*, etc. Bruce Foote remarks that these tools bear such a large resemblance to those of the Dakkan that we cannot but conclude that the people in both the regions were, if not actually members of the same tribe, at any rate on exactly the same level of civilization. Another interesting feature noticeable in the Salem tools is that they are more thoroughly ground and polished than those of the north. Their workmanship is much more thorough than that of average Dakkan specimen. The joint planes are in many cases, for example, obliterated, unlike in the Dakkan, by the beautiful polish. This difference in skill has been explained on the ground that the Salem neolithians lived in more peaceful times, had greater leisure to work at the implements, which is quite natural when we remember that the Dakkan was constantly and directly exposed to hostile immigrants from the north and that the Dakkanites had to spend much time in the extensive fortifications and defences of the castellated hills of their land.

Passing on from Salem to the west coast, we find that Malabar has revealed, in addition to a celt in pale granulite (the only specimen in South India made of that material) and a couple of beads, a very rich collection of ancient pottery. South Kanara is very poor; but the Mysore State has given a lot of neolithic remains, particularly of pottery. A so-called Kurumbar grave at Talya revealed nine vessels, one of which contained calcined human bones and the others only black earth. Amongst the objects discovered may be mentioned a drilled stone which seems to have been the socket for the pivot of a door which gives a clue to the existence of houses; the wheel of a toy cart, which indicates the juvenile amusements of the age; net-sinkers which indicate extensive fishery; powerful mace-heads; flooring tiles with holes in the back; tallies which give a clue to the existence of quantitative sense; and so on. The pottery of Mysore are both polished and rough, both decorated and un-decorated

The district of Bellary is rich in neoliths as in palaeoliths. The Face hill at Bellary was not only a neolithic settlement but saw the commencement of iron-smelting, if we are to judge from the abundance of iron-slag and fragments of haematite found in the place. The finds show the direct succession in South India of the neolithic age by the iron age. The haematite of Bellary Fort was apparently brought from the copper mountain 8 miles to the south-west. The discovery of pottery for covering the nozzles of the bellows also gives a clue to the existence of the iron-smelting industry. The fort-hill at the same place was also a large neolithic settlement. It has given numerous broken tools, pottery and chips of granite, including an excellent ring-stone regarded as rather rare in India. The Kupgallu hill, 4 miles east of Bellary, has been described as "the largest neolithic manufacturing industry as yet met with in any part of India." There is no doubt that the top of the rock which was easily defensible attracted the men of the period. The rock floor has evidences of the mealing of the grain by the primitive folk. Polished troughs for the same are not uncommon. Celts in the different stages of making and of different patterns, adzes, scrapers, cubical corn-crushers in granite of green and pink colours (which were evidently admired by these people and therefore got by them from considerable distance) have been obtained here. The different stages in the manufacture of celts and other tools can be understood from the remains of this place. The Peacock hill also furnishes some examples of neolithic sculptures or rather rock bruisings. The Gadiganuru neolithic site which is only next in importance to that at Kupgallu, is particularly well known for particular kind of celt, the prototype of the later iron axe, made in black schist, a material quite different from the basalt or diorite of the usual neolithic choice. Among other objects of interest discovered in the district may be noticed beads of of fresh water-shell, bangles of chank shell and the bull amulet which demonstrate the vanity and the magic-faith of the neolithic folk. One of the most striking features of the Bellary district is the cinder-mound found in a number of places. They are described later on.

Passing on to the Anantapur District, we have neolithic remains in nearly a score of places. All kinds of finds characteristic of the age have been found here.[1] The flakes of agate were brought from 60 miles off to the settlements, thus affording another example of the untiring industry of the men of this age. Some of the cores are so beautiful that they could have been drilled and converted into beads. The chank-shell bangles of the district show delicate workmanship. Evidently the Anantapur ladies of old had good taste ! In some places the transition from the neolithic to the iron-age is also clear. The local pottery shows variety of design and colour, and is often painted and adorned with fillets of finger-tip impressions and dots. Vajrakarur was a neolithic site, but we do not know whether the diamond was worked there during this age. Guntakkal has given a well-made wooden tooth-comb, the only example of wooden artifact available in India.

In the Cuddapah district neolithic remains have been obtained in a number of places. One of the finds is a small *lotah* filled with chunam like what is frequently seen in the rejected *chatty* of toddy-drawers, and it has been inferred from this that the palm-juice industry was prevalent in India in the neolithic age. This might afford consolation to those who are in search of the argument of antiquity for this institution ! the pottery and the shell-bangle industry of Cuddapah are also note worthy. It has been inferred that the fragments of the latter were either rejected on account of their breaking or that thev were deliberately broken by the women during widow-hood, as is the case even to-day among the Brinjaris and other wandering tribes. If the latter were the case, conjugal idea must be regarded as having made respectable progress during this period.

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[1] See *Madras Archæological Survey Report* for 1914-15, p. 39.

The District of Karnul is very rich in neoliths as well as the relics of the early iron-age. The pottery in some places seem to have been deliberately hidden for some reason. We do not know what reason, secular or superhuman, lay at the bottom of this. The piercers, drill-heads, tattooing points and lancets of agate, chert and lydian stone are very beautiful in colour. Evidently the folk of Karnul were prepared to undergo the tortures of tattooing provided the instrument was nice-looking! Curious libation vessels, vases like flower-pots, bowls with stout lips and purple stripes, sling-stone resembling the British type, and other finds indicate that the district was a very rich settlement.

Passing on to the coastal districts, nothing note worthy has been discovered in North Arcot except a Kurumbar ring, a circular encampment with a double line of circumvallation, which might have belonged to the neolithic age. Chingleput which has produced the largest number of palaeoliths in South India, is poor in neoliths. Similar is the case with Nellore. Guntur has contributed a mace-head of granulite with incomplete drilling, besides an excellent drill-core and a few other things. Krishna district also is very poor and has yielded only, in the Nandigama Taluk, yellowish earthenware of inferior quality which "very probably served as the food vessels of the poorer people." A great *tumulus* at Nandigama might have been neolithic. The mounds west of Gudivada are proto-historic.

The Hyderabad State has revealed a large number of neolithic sites. The Raichur duab has, amongst other things, given some earthenware things resembling stoppers for bottles of different sizes. Apparenthy the art of keeping things in suitable receptacles was understood! Some of the Hyderabad flakes show much taste for colour and the importation of the material from Cuddapah or Karnul. The adze found in some areas has been compared to the type of Polynesia and South Sea islands. A chert saw-flake found in the state has been regarded as the most beautiful in the world. It has been inferred that the country around Raichur was a favourite neolithic settlement and this is due probably to its situation on the route between the north and the south. The Maski site is curiously enough, not so characteristically neolithic A grinding slab for producing red pigment out of riddle-stone is one of the interesting things found here. Another is a bone-rod on each of the four sides of which concentric rings have been carved. Bruce Foote surmises that it was probably a priestly conjuring staff,—one of the numerous clues to the religious sense of the age. Maski has also yielded a large number of agate and chert flakes, shell-bangle and other ornaments and some remarkable pottery. The ornaments consist of pendants and beads of cowry-shells. A small disc among them is surmised to be a currency token just like that prevailing in some Western Pacific Islands. If this were the case the Dakkan neolithians must have understood the economic process of traffic through a medium of exchange. The shell-bangles show decorative carvings of various devices. Among the pottery, the right jamb of the door of a small urn and the figurine of an animal (horse or bull), probably used as a votive offering, have been found. Amongst other interesting finds may be noted children's toys in marble and earthenware. The banks of the Tungabadra have given big red painted bowls as well as four-footed vessels with long horizontal diameter and an opening and a lid. Lastly, a cylindrical bead in *lapis-lazuli* in a local fort has been found side by side with old pottery.

The neolithic remnants in South Bombay are meagre. Dharwar and Bijapur have yielded only a few celts. Belgaum district has given a thumb-stone, a tool common in western Europe but rare in India, the only other specimen of it having been found in the Baroda State. The central part of the Bombay Presidency has not yet been sufficiently explored; and Bruce Foote's opinion is that "if closely examined by an expert there can be little doubt but that the indications would be found of the occupancy of parts of this great area by some of the neolithic people. Whether the palaeolithic people ever inhabited this country which is utterly devoid of the sileceous rocks of which they loved to make their arms and tools, may however be well doubted." (*Notes* p. 135).

In Gujerat, neolithic finds have been made in the alluvial valley of the Orang river, a tributary of the Narbada, and a number of other places. The flakes are often remarkable for the beauty of material, form and colour. The mace-head or ring-stone found at Serula and the thumb-stone found at Kanja, are particularly noteworthy. Several sites in Gujerat are surmised by Bruce Foote to be temporary neolithic settlements. Some of them have given good pottery besides a smoky-grey bottle with incised pattern. Another site has given fragments of human cranium, though it has not been possible to make out anything of the build of the neolithic men. Some of the selected stones in these settlements were brought, as we have seen in other parts of the country, from long distances. Amongst curious and interesting things found in them may be mentioned a *linga*; a strange object like the neck of a bottle which has been surmised to be a smoking pipe; and a disc-used in some game. The champions of smoking and perhaps dice can boast of the ancient character of their virtues! Similarly, traces of the shell-bangle industry with zig-zag patterns, pots ornamented with fillets of pitlets and the usual plates and cores have been found. The figure of a sacred bull with a garland round his hump indicated by square pitlets gives a clue to the cult of the period. The humped bull was thus a neolithic institution! A site on the right bank of Sabarmati has revealed some excellent finds in stones like cherts and amazon-stone brought from distant places. The Gujerat neolithians were evidently a painstaking community.

Kathiawar has revealed neolithic finds in a score of places. These finds include chank-shell bangles, shell beads, an archaic spindle (which indicates the prevalence of the art of spinning), and very high-class pottery which is quite distinct from the types found elsewhere. The ware is red in colour, hard in texture and fired. The Gujerat finds also include several ornamented vases, stone works of very great beauty and tasteful choice, shell-bangles of as many as 17 varieties, an arrow-head worked in chert, and curious flakes which might have been arrow-heads, small drills or tattooing instruments. The *lotahs*, *chatties* and dishes of the different colours, shapes and paints found in the Jetpur State form an interesting set.

Sindh and Baluchistan are comparatively meagre. The town of Rohri has given several flakes and cores of a comparatively poor type ; but the Khelat State has revealed certain urns of coarse make and pale colour which are "remarkably unlike any type of pottery met with in the south of the peninsula, in the Deccan, in Gujerat or Kathiawar."

Central India has not been sufficiently explored. Only a few neolithic remains in the vicinity of Jubbalpur have been obtained. They include a burin of chert like that discovered in French caves. This instrument was used in the latter country for engraving upon bone and ivory the figures of animals. Flakes of chalcedony and chert with perforated bulbs and cores of jasper and agate of good workmanship have also been traced. The State of Banda was inhabited in the neolithic period by the same race which lived in Southern India ; for celts and axes of the basic trap in the southern style have been discovered there. The Rewah State has yielded drilled pebble, massive mace-heads, quartzite slick-stones or smoothing stones and mealing-stones.

Passing on to the Central Provinces there is a controversy as to whether a few flakes discovered here were arrow-heads or not. Bruce Foote argues that they were not, on the ground that Indian neolithians did not care to make stone arrow-heads on account of the abundance of the thorns which could be used for the purpose. The celts discovered in the province have been surmised to be, on account of their minute size, not agricultural implements, but either toys for the children or miniature weapons used for ceremonial purposes or symbols or rank of office.

We have got no neolithic finds in Bengal.

Ceylon has revealed a number of finds which prove the similarity of conditions to those of South India and which made the Ceylonese shape hard stones into scrapers wherewith to reduce the thickness of the shafts of the arrows, lances and javelins to the required size. Some of the Ceylon quartz objects again are true arrow-heads unlike in the mainland. The neolithic finds of Ceylon are mostly in quartz and occasionally in chert. Some scholars place them in the Old Stone Age, but others (*e.g.* Bruce Foote) place them in the neolithic period.

THE WORLD UNITY OF NEOLITHIC CULTURE

The Indian and European neoliths bear a great resemblance in several respects and differ strikingly in other respects. There is an extraordinary unity in the methods of work and the general conception. The Tinnevelly sling-stones are exactly like the English and the Tinnevelly arrow-head, the only type found in India, is exactly like the French type. The sling-stone of Karnul has been compared to that found in the Cotswold hills. The thumb-stone in Gujerat again has been compared to the Swiss type. As compared with the European, Indian neoliths are rare in burins, ring-stones, thumb-stones, and arrow-heads. The arts of perforation and hafting also which made great progress in Europe, were practically non-existent in India. Bruce Foote gives only one example of the perforated celt in India—the one found in the Shevaroy hills. Even this has got a bore which is incipient and not fully worked out. Foote wonders why this specimen "should have been only just started and carried no further." To drill socket-holes for the handles of the celts would have been easy for people who bored through the hard varieties of stone employed for making mace-heads or ring-stones; and its absence in India is an inexplicable mystery. Similarly in hafting Bruce Foote finds less intelligence in the Indian neolithians, though the system of attaching weapons by the cutting of belts as in belted hammers was understood. While the hafting of celts might have been difficult, the hafting of true axes, points out Bruce Foote, "would have been done with less difficulty, as from their elongated and slimmer shapes they would have been fitted into a hole in the club-shaped branch of a tree of which the wood was very tough and durable, such as that of the *hardwickia* and *acchamaram* of the Tamil people." The same scholar further goes on to observe that "no evidence has been obtained in India of the plan so largely adopted by the Swiss lake dwellers of fitting the taper end of the axe into a piece of stag-horn, and this into the club-headed haft, the great toughness of the stag-horn being supposed to assist the wood of the haft in resisting the strain."

In spite of these differences there is no doubt that there was a common origin for the neolithic culture of both Europe and Asia. The labours of the Crown Prince Gustaf Adulph of Sweden and others who have examined the neolithic sites in Greece, China, Manchuria, China and Japan have proved unmistakably that in the manner of manufacture, general appearance and decorative designs the neolithic and bronze age pottery of Eastern Europe, Western Asia, South Russia, Baluchistan, etc. indicate a common origin. Central Asia has been suggested as such a common home.

ANALYSIS OF NEOLITHIC ARTIFACTS

The Indian neolithians made a wonderful variety of tools and implements. Col. Bruce Foote who has made a characteristically minute and analytical study of them mentions no less than 78 distinct types. Of these 41 belong to the ground and polished class and 37 to the un-polished variety. Among the polished class he enumerates adzes, anvils, axe-hammers, celts, chisels, corn-crushers, hammers, hammer-stones, hones, mealing stones and troughs, mortars, mullers, net-sinkers, pestles, polishing grooves, slabs for grinding, slick-stones and whet-stones. The polished variety do not only include these fabrics of war and peace but also several articles of luxury like beads, buttons, discs, marbles (toys), palettes for rouge, pendants, pencils of steatite, vessels, tally stones and articles of religion like the phallus and human as well as animal figurines. Among the unpolished class

Bruce Foote mentions anvils, bone-splitters, burins, engraving tools, arrow-heads, cores, discs, flakes, flakers, knives lance-heads, lancets, mallets, pelting-stones, scalpels, scrapers, sling-stones, wedges, etc. Many of these have got several sub-types. The adzes, for example, are of two kinds, a short and long one. The axe-hammers are of three types, the body of the weapon being sometimes narrow, sometimes broad and thick, and similarly either long or short. The celts are of twelve varieties, the edges being oval, square or curved; the bodies being narrow, thick or cylindrical, and so on; the ends being pointed or blunt; and the sides being round, levelled or square. The neolithic chisels similarly display six varieties, the sides being square or triangular and thin or thick, and the edges being pointed, broad, elliptical or cross-cut as the case may be. The hammers, again, are square, round or belted. Mealing stones are sometimes flat and sometimes round. Mealing troughs are either deep or shallow. There are six varieties of cores and flakes. The scrapers are sometimes small and sometimes extended, sometimes in-curved and sometimes not. The arrow-heads are of three types, but the remarkable fact about them is that they are not made of the *chert*, *agate* and *jasper* rocks which were chiefly selected by the neolithians for their implements, big or small. Further, stone arrow-heads are exceedingly rare in India and Bruce Foote[1] attributes this to the abundance of big thorns of some trees, which served the purpose equally well. He also believes that arrow-heads of hard wood used for shooting fish by some of the west coast fisher-folk might have been invented by the neolithic archers, though no such wooden finds have thus far been discovered.

[1] Bruce Foote has discovered only three or four examples of stone arrow-heads, at Sawyerpuram in Tinnevelly, Umria in Kathiawar, Ramdrug in Bellary and Rawalkonda in Hyderabad; but all these he regards as doubtful. He points out that for a people who could chip the exceedingly delicate, pigmy knives and serrated flakes and finished scrapers in Gujerat and Deccan "could have had no great difficulty in manufacturing stone arrow-heads had they been inclined to do so." Thorn-headed arrows served their purpose very thoroughly. He believes that it was this perhaps that led to the bow, later on the favourite weapon of the Aryans, being provided with arrow-heads of stag-horn or bone. See *Notes*, pp. 182-3; p. 151.

The varieties of each group of tools and weapons might be explained either on the ground of varieties of fashion or of local tastes. In explaining the origin of the different kinds of celts, for example, Bruce Foote suggests that, as the neolithians invariably chose such materials for their tools as minimised the labour that had to be spent upon them they sought for such specimens as "were so shaped by the existence of joint planes as to approximate to the forms they desired to produce, in the same way that their palaeolithic predecessors (possibly actual ancestors) selected individual large pebbles that could be converted into shapely implements with the minimum of chipping. There are many examples in the collection of the selection of rock fragments conveniently shaped by joint planes, the presence of which must have very materially diminished the quantity of chipping requisite to produce good celts." Foote gives, as example an elegant celt found at Sanganakallu, in the Bellary district, which has no less than five joint planes, which would have saved immense labour to the chipper. One of the neolithic celts, the thin bodies variety, was the direct ancestor of the later broad and thin iron axe. As this, type of celts is found only in the fine-grained, hard trap-poid schist west of Gadiganuru in Bellary district, a rock met with nowhere else in the Dakkan, Bruce Foote calls it the Gadiganuru type.

The neolithic men were good artists. They had a fine taste for colour[1] and therefore chose stones of different colours for making their things with. They were fond of the types of rock called pistacite, granite with green and pink tints and chrome gneiss which has delicate, greenish-white and green colours. These rocks were sometimes got from great distances, with considerable labour and even risk, through regions occupied by hostile tribes. The selected stones were usually worked into mealing-stones and corn-crushers which could have been equally made from the country rocks. The neolithians also deliberately select-

[1] In the pre-historic caves of Italy there have been found some 'Pintadoras' or terracotta stamps for applying red colour to the human skin for personal adornments. Such things have not been found in India.

ed and got, from distances, varieties of bright and gay-coloured stones like the *chert* and the *agate* which are abundant in a number of localities in the Dakkan, Gujerat and Kathiawar, for making drill-head flakes, scrapers and strike-a-lights out of them. Bruce Foote also refers to the neolithic appreciation of emerald-green amazon stone or *feldspar*, obtained from a granite vein in the Sabarmati bed; and of earthy-red haematite or *reddle* which was used to produce red powder which could serve as rouge or as paint when mixed with suitable liquid. He enumerates 13 sites which yield these reddle stones, nine of which are in Bellary district, one in Anantapur, one in Hyderabad and one in Baroda. Many of the stones were apparently ground very often. Slabs for grinding or rubbing down the reddle, one in haematite schist and the other in grey-brown sandstone, have been discovered in Bellary and Maski. The preparation of colours was thus a highly beloved art of the age, while the best flake knives and pigmy implements were made in chalcedony, cornelian, agates, cherts, jasper and other selected stones of natural colours. The discovery of gold, of iron, of diamond and other precious stones, it may be added, was natural to people who were acquainted with these materials ; we shall discuss this question presently.

THE NEOLITHIC HABITATIONS

The neolithians had their settlements as a rule in the bold, castellated granite rocks which are abundant in the Dakkan and which can be conveniently walled and otherwise adapted for safe dwelling. Many of these granite rocks have natural fissures which afforded the dwellers good shelter from sun and rain. The granite rocks were chosen in preference to other rocks (like those of the Dharwar, Cuddapah and Karnul systems), as they could be more easily fortified and as they were more valuable for the catchment and storage of water. No neolithic houses have been discovered in India even in such busy centres as Bellary and Salem. This was probably due to the fact that the materials were in straw and twigs which were destroyed in course of time. Tiles were not used, if we are to judge from the absence of pot-sherds. The thatch was apparently the style prevalent then as now among the lower classes. Timber also probably played a very important part, developing the carpenter's art. The house-carpenter was also probably the maker of ploughs, dug-outs, etc. The size of a neolithic settlement depended on the extent to which rain water could be stored. Many chose sites where there were natural cisterns in very good shelters. Where there were no natural depressions, artificial ones were made. No circuit walls of neolithic settlements have been traced in India. This was due probably to the fact that thorny fences were preferred to permanent walls—a feature which is commonly seen even to-day. As has been already said, no examples of extensive kitchen-middens as in the West have been found in India. Some of the settlements however were on the coast. The interior settlements were more numerous. Some of these were very extensive in size.

One peculiarity in the India of the neolithic period was the abundance of cinder-mounds in several places in Bellary and Hyderabad. These mounds consist of several layers of slaggy cinders of yellowish or grey colour, resting on made-ground and ashes. Several of them indicate the remains of big camps. Some antiquarians regarded them as 'volcanic ash-cones.' Popular legends describe them as the ashes of giants and demons. Still others, equally imaginative, describe them as the remnants of human or animal sacrifices made by holy Rishis! But modern opinion is certain about their being the remains of neolithic camps and settlements. The presence of corn-crushers, mealing-stones, celts, animal bones, fragments of pottery, flakes and cores, indicates clearly a neolithic origin. The fragments of some camps show impressions of coarse straw (like that of the *cholam* and *jonnalu* of the Tamil and Telugu peoples), thus indicating its use in that period. It has been suggested by Bruce Foote that some of these camps were the outposts of neolithic watchers who constructed huts which were burnt from time to time and renewed. He also suggests, on the analogy of the African custom, that the mounds might have been due to the conflagrations of big cow-dung mounds, caused either by carelessness or by the desire to give hardness to the vicinity in the course of the rainy season. Both these suggestions seem to be rather fanciful. The theory of the frequent destructions and renewals of outposts is more convincing. The saliant fact to be understood is that, as no bones have been found in these mounds, they could not have been the sites of holocausts of animals as they have been sometimes taken to be. It only remains to be added that these cinder-mounds are peculiar to Bellary District alone. They have been found nowhere else except in the vicinity of the Wandalli gold mine in the Raichur taluk, Hyderabad State, where two typical camps were discovered by Mr. Bosworth Smith.

LIFE IN NEOLITHIC TIMES

A definite conception of the modes of neolithic life in India must be possible from what we have thus far said. It is clear that, when compared with the old stone people, the new stone people were perceptibly advanced in many lines of culture and progress. We can imagine that the men who turned out the stone implements of the polished type, lived and laboured in almost every part of India. We can imagine their wanderings over long distances in search of climes and lands where they could find plenty of game and living which had disappeared, thanks to their effectual and destructive tools, in the homes they had just left. We can imagine them settling on the coasts in the fringes of the shallow seas or the shallow lakes and river estuaries, though we have not got yet instances of pile-dwellings in our country. We can see them, as we progress in time, settling successively in trap areas, in pastoral lands and then in places rich in minerals, when once these were discovered. We can imagine them occupying convenient hill tops and manufacturing their tools at all times of the day with unceasing labour. We can see them settled in groups of huts, round or square, of wattle and thatches, daubed with clay, not unoften constructed with skill. We can see their settlements guarded by fences or fortifications made also of perishable materials. We can see the observers from their huts in conspicuous places looking hawkishly towards the horizon for sight of an inimical man or beast. We can see them scoope out rock-surfaces for holding water, the women engaged in company and in a kneeling posture, in honest toil in the mealing troughs on the rock surface. We can see scores, perhaps hundreds, of men at hard work at the different processes of pecking, chipping, smoothing and polishing, women helping them. We can see the men constantly engaged in the chase and in fishing, the women perhaps cooking the flesh in spits in the fire made by friction. We can see the interspace between the cluster of huts, tenanted by the cattle (goats, sheep and cows), the buffalo, the dog and the swine.

The food of the neolithians consisted of the fruits, roots and nuts which could be got from nature, the flesh of the animals they killed in the chase or obtained by other means, the fish they caught inland as well as in the seas, and the wild grains, millets and pulses which were indigenous to the tropical and temperate soils of India in their wild forms. Many of the cereals, millets and pulses which were afterwards artificially cultivated, were originally obtained in their wild varieties. We may also suppose that in addition to these, milk and vegetables which could be got in plenty were largely consumed. The neolithians knew the art of cooking and preparing delicate *menus*; for the discovery of mealing-stones, mealing-troughs, mortar and pestle, corn-crushers, etc. indicate progress in the culinary and confectional arts! Almost all those articles of food and drink which are in vogue among the least advanced of the plain communities and almost all the hill-tribes, were probably known then. The neolithians seem to have known that common drink which is nowadays a consolation to labourers, namely, toddy; and we may be certain that the men and women of that period knew many another juicy extract. The process of turning milk by fermentation into curd and the preparation of whey and ghee from it might have been a very early discovery if we are to judge from the fact that even now the towns-people are supplied with these articles of diet by people from the retired village or even wild parts. Honey was no doubt a delicacy known to this period.

The dress of the neolithians was necessarily very scanty aud primitive. Even to-day many communities in retired parts and hilly regions are, thanks to the tropical climate and to custom, very scantily clad in India. It is not rare to see even women leaving the upper parts of their body uncovered. A custom which has defied time and environment for so many centuries, was probably universal in the neolithic age. The scanty dress is illustrated in the early paintings and sculptures of India. The dress that was worn in this age was at first, as in the palaeolithic period, in the form of leaves or barks of trees and the skins of animals. In historic days this custom was made the symbol of resignation. The wearing of the tree-bark became the recognized mode for retired sages and kings. The primitive skin-robe came to be symbolised in the *krishnajina* of the Brahmacharin. But among the more primitive communities the custom of wearing leaves, barks and skins was not a symbol of contentment but a reality,—a feature which continues among hill-tribes even to-day. The neolithic age however saw the invention of weaving and the clothing of men and women in cotton and wool. The art of plaiting leaves might have led to the idea of weaving, a clue to the progress of which is afforded by the occurrence of slick-stones among neolithic finds. The habit of wearing woollen blankets which the Kurumbas, shepherds and cowherds have even in the present day, seems to indicate that the woollen clothing was earlier.[1] But cotton was not, we may believe, far behind. It is now an established fact that India was the country where cotton was first cultivated and utilised for weaving into dress. From the acknowledged facts that Egypt and

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[1] As Mr. P. T. Srinivasa Aiyangar shrewdly suggests.

Assryia imported cotton fabrics and that cotton fabric has been discovered among the recent archæological finds in the Sindh valley it is clear that cotton manufacture was known in India previous to the Sindhu civilization which belonged to the 4th millennium B. C. The neolithian of India was the apparent discoverer, in other words, of the cultivation and manufacture of the greatest of the articles of traffic among mankind. And as cotton was wild[1] in Kathiawar, Gujerat, Khan-desh and the Dakkan we may suppose that it was first brought into the service of mankind in this region. When weaving was discovered, the art of dyeing naturally followed. Materials for the manufacture of colours have been discovered among neolithian finds.

The method of dressing was simplicity itself. Men probably wore a small piece of cloth round the loins and threw another loosely over the shoulders. The turban was probably a fashion even then, as it has been ever since. Women, it seems, wore a kind of petticoat coming down to the knees. They probably had the upper parts of the body, as a rule, bare as in the case of the hill-tribes and primitive communities even to-day. Women displayed their characteristic vanity even in neolithic times. They dressed their hair with the aid of combs in short ringlets round the head, with a cap-like ornament at the top. As neck-rests have been found among the neolithic finds, we have to infer that the beaus and belles were careful to protect their ornaments from being spoiled during sleep! They adorned their person with beads, pendants, rings, bangles, armlets and other ornaments of selected stones, shells and bones. The ornaments of the first type found in neolithic monuments show a high taste for beauty, colour and picturesqueness and indicate that the men and women of the period could not have been wanting in romance! Most of the shell and bone ornaments were cheap and did not cost much labour; but from the occurrence of beautiful beads, delicate boring instruments and drills, etc, we have to infer that ornamentation already possessed the dignity of a high art. One characteristic in India is that the jeweller's art has never been professed by the classes occupying the highest status. Are we right in inferring that the artistic sense of the Indians a non-Aryan, pre-Aryan legacy? It may be added that the art of dyeing made a perceptible advance in the period and the men and women might have their dresses dyed red, yellow or in the indigo-blue, which was indigenous to the country.

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[1] See Sir George Watt's *Commercial Products of India*, p. 582.

The occupation of the neolithians was variegated. The most primitive of them were engaged in the chase of game upon which they lived. Some of the pre-Dravidians might have been permanently driven into the hills and woods to eke out their livelihood in this ancient fashion, while the more advanced people in the plains valued the occupation for its amusement or for economic necessity. The Kadirs, Irulas, Paniyans, Mala-vedahs and similar tribes of the hills and the Kuravas of the plains still carry on this type of neolithic life. It seems to have given rise to the later Tamil term *kurunji* or hill-life.

Next to the chase, fishery was the important occupation of the neolithians. These belonged both to the inland areas but preferably to the coasts. The large number of coastal settlements (corresponding to the kitchen-middens of Europe) indicate the permanent coastal habitation of many neolithians, no doubt after a lot of preliminary wanderings. It is possible that the professional fishing castes like the Bharatavars, Pattanavans, etc. are the descendants of the neolithic settlers. The part played by these in early economy must have been much more important than in later times. The primitive canoes, *catamarans*, dug-outs, etc. which we see so often even in the present day are probably neolithic survivals. It was in these frail floating things that the peoples of the age ventured at times for miles into the sea and moved for hundreds of miles, sometimes in the form of mass-movements, along the coasts. The history of man affords examples of migrations through thousands of miles in this manner. The abundance of net-sinkers in the neolithic remains shows that the fishing was at times at least on a large scale and probably co-operative as is occasionally the case even to-day. The fishermen communities of the coast tended to become hereditary and they came in later days to be classed as a distinct community characteristic of the coastal area or *neydal*.

Another neolithic occupation was the tending of flocks of domesticated animals when this became common. The principle of hereditary occupation probably operated from the very beginning and so particular communities devoted themselves to habitation in grass-lands on the slopes of hills or plains, the maintenance of flock and the wanderings from place to place in search of fresh pastures. Even to-day one can see in the south such peregrinating men and flocks. Goats and sheep, oxen and cows, ducks and poultry can frequently be seen in hundreds, sometimes thousands, led by a few men from district to district and getting paid for locating their herds for a day or two in agricultural fields for the sake of the manure. There can be no doubt that the neolithic cowherds and shepherds were, as in later historical times, a jolly and lively community, fond of music and dance, addicted to gay festivals and innocent amusements. The occupants of the *mullai* or pastoral areas figure in later Tamil literature as the participators in special festivals and dances in honour of Krishna, Vishnu ; and this shows that Krishna was originally a deity of the pastoral communities. It has been suggested[1] that owing to the prevalence of the Tamil *kon*, *konar* (கோன், கோனார்) to denote both the cowherd and the king, the institution of kingship—a necessity for the regulation of wandering life—was due to the pastoral peoples. The philological basis of the theory is rather doubtful but there is nothing improbable in the theory itself. It has also been suggested[2] that, owing to the difficulty of partitioning grass lands as compared with agricultural areas, pastoral life fosters the joint family system and that the latter can therefore be traced to neolithic times. This suggestion cannot stand much scrutiny as even agriculture was for centuries joint and communal. It was only very slowly, perhaps after centuries, that the idea of individual property came into existence. All early life was communal. The growth of civilization has always meant the growth of the sense of propriety and individuality. But there is no doubt that agriculture favours the growth of the individualistic property unlike pasture; and this explains why even after the growth of individual ownership of arable areas in historic times the grass lands remained common to the whole village. And no doubt it was this communal life that led to the institution of definite village settlements and tribal chiefdoms. The original communities of the pastoral areas (the *mullai* of later Tamil literature) gave rise to the Kurumbas, Idayas, etc. of later times. It may be pointed out that it was the Kurumba shepherd that probably saw the serviceableness of the wool of his kurumbadu (குறும்பாடு) for being woven into blanket, thus giving rise to the profession of weaving.

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[1] P. T. Srinivasa Aiyangar's *Stone Age* in India.

[2] *Ibid.*

AGRICULTURE

The most important occupation of the later neolithians was agriculture,—their greatest invention and service to humanity and civilization. The neolithians no doubt depended originally on wild grains; but soon they imitated nature and began cultivation through their own labour and skill. The progress of bringing the wild grains, millets and pulses which were indigenous to the land must have been at first slow; but when once it was known it made rapid progress. It is a very obscure and difficult, though interesting problem as to which of the grains, millets and pulses were indigenous to neolithic India. We have already seen that there are remnants of *jonna* or *cholam* in the cinder-mounds. We know that rice was in a wild condition in the Indus valley. Many of the tropical articles were common to India, China and the lands further east; but there can be no question that the vast majority of them seem to have been first brought under cultivation in India. Many fruits and nuts also might have been brought under artificial rearing. As regards the methods of cultivation it was no doubt at first temporatory or migratory, then "terraced" and then regular.

. One thing which must have naturally struck the neolithians when they discovered and pursued agriculture was that for the cultivation of the grains they had to depend on the monsoons entirely and that, if they were to avoid disaster, they should store the water against adverse seasons. The needs of cultivation (as well as of drinking water) thus might have given rise to the idea of artificial reservoirs for which India has always been famous. The system of storing water had prevailed even in the earliest of the palaeolithic days; for as we have already said, men chose their settlements on hill tops where there were natural facilities for such storage. The practice of conserving water in artificial as in natural reservoirs was for the first time probably adopted by the neolithians. The process of carrying water from the tanks or lakes to fields by artificial canals after this must also have been easy. It is natural for the people to imitate the course of natural rivers. Again, the neolithians probably discovered the art of constructing wells. The necessity to lift the water from the deep soil below must have led to the invention of minor occupations like the making of ropes out of fibres of special trees like the cocoanut or out of the skins of animals, natural creepers also being perhaps occasionally used. The well-irrigation by means of lifts (*erram*) and draught oxen (*kapilai*), so common in India even to-day, might have been neolithic inventions; for when man found that his own labour was not sufficient, he naturally bestowed his mind upon minimising the physical energy and invented the lift, utilising the services of the beasts of burden with which he was already acquainted. In this way the most common methods of irrigation came into existence. Similarly the neolithic man, when he became acquainted with agriculture on a fairly large scale, must have come to distinguish between the cereals and millets and pulses and understood the different amount of water required by them, the different environments in which they had to be reared and the different modes of cultivation to be employed towards them. He must have seen that some crops required great amount of water, others less, others still less. He must have seen that some would grow only on wet fields, others on dry ones; still others on alluvial soils; and so on. He must have observed that while some required much human labour and skill, others depended primarily on the gifts of nature. It was in this manner that the ideas of wet and dry cultivation suited to the different cereals, pulses and millets,—the later ideas of the *punjai*, *nanjai* etc., came into existence. Whether the agricultural fields became divided into strips or whether they were held in common by the whole community we have got no evidence to say, but if we are to depend on analogy it must have been communal. In early times all idea of property was, as has been already said, social and communal and not individualistic.

REGIONAL COMMUNITIES

It is very probable that by the close of the neolithic age the tendency for the permanent division of the people into these five geographical and occupational divisions became more or less definite. The neolithian society did not apparently pass through a horizontal but vertical progress. A pastoral section would permanently remain pastoral; a section which had become industrial would have remained industrial and so on. Instead of the whole society passing through all the stages of progress different sections of it would be permanently under the different stages of progress. The difficulties of distance and communication were no doubt at the bottom of this. The differences between the pre-Dravidians and the Dravidians must also have contributed to the differentiation. The hill-tribes, for instance, as well as the coastal tribes were probably pre-Dravidians. The plain-men and occupants of desert regions might have been mixed peoples, while the agriculturists were probably Dravidians. Mr. P. T. Srinivasa Aiyangar is of the opinion that the five geographical divisions of the *neydal* (coastal), *marudam* (agricultural), *mullai* (pastoral), *kurunji* (hilly) and *palai* (desert) referred to in Tamil literature must have been formed in the neolithic age. He believes that the *Paradavar* of *neydal* extended from Gujerat to the Gangetic delta and that, with their boats, canoes and *catamarans*, they engaged in ordinary fishing as well as the pearl and oyster ones. He sees in them moreover the ancestors of the modern lascars. Similarly he sees the Vellalars and Velir (வேளிர்) settling as cultivators and landlords in wet-fields and the Karalar (காராளர்) in dry fields requiring tank and well-irrigation, cooperating to produce the rice, millets and pulses needed for the country. He sees the Idayar and Ayar (ஆயர்) settling in *postoral* lands and spending their days, as pastoral people always do, in dance and song. He sees the Kuravas of the hills and the Maravas of the desert settling in their respective spheres, showing the link between the palaeolithic and neolithic stages or types of life. He sees even in the Vedic *panchajanas* a reference to this five-fold division so graphically described in Tamil literature. I cannot say how far the social and occupational terminologies referred to by the suggestive scholar were current in the neolithic period. I do not think that one is justified, on the basis of the evidences at present available, in dogmatising about the names of persons and people. We have no definite knowledge of the language spoken by the neolithians. We cannot say what was the original language of the pre-Dravidians, what relation it had towards that of the Dravidians. Then again there is the complication of the Munda tongues. It may be that in the course of the neolithic age the chief linguistic families of the world—the Indo-European, the Semitic, the Ural, the Austro-Asiatic and the Bantu—became divided from one another differing completely in the sound system, morphology, syntax, etc. But we do not know the exact position of the 'Dravidian' in relation to the 'pre-Dravidian', the 'Munda' and even the Indo-European families. To say under these circumstances that certain terminologies must have come into existence in the neolithic age is not justifiable. Nor am I satisfied that the Vedic *panchajanas* were the five types referred to in Tamil literature. But there can be no question that as the neolithians progressed from the nomadic life necessitated by the fishery, the chase and pastoral life to the agricultural, the tendency for particular sections of them to be confined to particular geographical areas or environments, became stronger, thus laying the basic foundations of society as described in Tamil traditional literature.

THE GERMS OF THE CASTE SYSTEM

The tendency for the neolithians to become specialised into the peoples of the coast, lakes, forests, hills, deserts and agricultural (or mining) areas, was no doubt instrumental in inspiring and fostering that system of social groups and sub-groups, divided from one another by elaborate restrictions regarding marriage, interdining, etc., which is known as the caste system. It is the opinion of most scholars that the caste system is a Brahmanical institution. In the Cambridge History Prof. Rapson observes: "The institution is essentially Brahmanical, and it has spread with the spread of Brahmanism. It either does not exist or exists only in an imperfect state of development, in countries where Buddhism has triumphed, such as Burma and Ceylon. It would indeed appear to rest ultimately on two doctrines which are distinctively Brahmanical —the doctrine of the religious unity of the family which is symbolised by the offerings made to deceased ancestors and the doctrine of *sva-karma* which lays on every man the obligation to do his duty in that state of life in which he has been born." M. Senart has developed the Aryan theory on much more ambitious lines, (see *Impl. Gazr.*, Vol. I, pp. 339-43). But an unbiassed inquiry into the history of castes shows conclusively that, while there is much truth in this, there is also much exaggeration. Dr. Macleane pointed out long ago that the caste system is as much the work of the Dravidians in South India as that of the Aryans. In any case, he points out, when once the institution came to be introduced, it was taken by them with as much zest as by the Aryans themselves. In fact, if we can judge from what is taking place every day before us, the caste instinct seems to have been more developed under the non-Aryan communities of the population than under the Brahmanical, who are generally and correctly associated with Aryan culture. Risley observed long ago that castes have progressed on the basis of race, tribe, religion, nation, occupation, climate, geographical isolation, blood intermixture, migration, rise of strange customs, and various other factors which are natural and not the work of a particular community, however instrumental it might have been in the development of civilization. The very fact that the Mahomedans, the Christians and adherents of other non-Brahmanical faiths have adopted the system shows that there are elements more of a natural than human, particularly Brahmanical, agency in the evolution of castes. There is no doubt that the Brahmanical priests gave a spiritual and Sastraic sanction to castes in consequence of their doctrines of spiritual unity and *svakarma*, as it was absolutely necessary for the safeguarding of the Brahmanical notions of culture and civilization; but all that can be inferred from this is that the Brahmans utilised, as in almost every field of their activity, to their own advantage what they found already in the land. It was against the nature of Brahmanism to go against the current of popular customs and prejudices. It always secured its triumph by compromise, by taking account of the institutions which it found and adopting them for its own purpose. And in this process of adjustment the indigenous communities themselves co-operated. To speak of antagonism, of rivalry, of the super-imposition of tyrannical Brahmanical institutions on other communities is, to say the least, untrue and un-historical. So far as human instrumentality is concerned the non-Brahmanical communities were as responsible as the Brahmanical. But nature was more powerful than both. And the earliest evidences of this influence of natural environment are afforded by the trend of social progress in neolithic times. Even such a head-long champion of Dravidian culture as P. T. Srinivasa Aiyangar concedes that the caste system with its marital regulations of an endogamous or exogamous character and other restrictions, was the creation of the tendencies of the neolithic period. I cannot agree with his contention that the Aryan *varnasrama* was only a cross division based on a fire-cult as against the pre-Aryan non-fire or agamic cult; but there can be no gainsaying that the caste was a pre-Aryan institution, though after the Aryan advent, it was given new forms, new vitality and new significance.

SOCIAL GROUPS

The division of the neolithians into the tenants of the different geographical regions—which in its turn was based to some extent on the racial distinction between Dravidians, Mundas and pre-Dravidians—was naturally followed by rivalries between them. In course of time distinctions between the members of the same group increased under the circumstances enumerated by Risley. A race would become divided into tribes; each tribe into a number of social groups on account of natural and conventional factors. The most important of the latter was the rise of different totems,—a universal feature of the Dravidian race in particular. The division into totemistic septs would be complicated by sub-groupings on the bases of kinship, companionableness, fertility, sex, dialects, common interests of a secular or spiritual kind, common actions and common difficulties. The groups and sub-groups would naturally be based on the institution of marriage based on the principles of free or specific exogamy and endogamy. As a result of this, there arose, a jealous separation of bachelors and compuslion to live in set quarters. We know that amongst all the primitive tribes there are bachelor's houses into which no woman is to enter. Here everybody has to sleep till he marries. Sometimes it is a dark dirty dungeon, but the inmate is not unhappy. Whenever such a Naga *champo* is built there is the observance of an elaborate ceremonial. A dog is killed on the occasion and this is regarded as the remnant of human sacrifice which exists in bachelor's houses in New Guinea and elsewhere. It is certain that these are only survivals of neolithic ideas. Similarly the customs of teknonymy, of *taboos*, of cousin marriages and similar kinships besides matriarchy became common.

We cannot positively say whether it was the custom among all sections of the neolithians to qualify oneself as a warrior or for marriage by taking a head or a ear; but that it was widespread there is no question. Woman's head was probably, as among modern Nagas, a more valuable trophy. An economic tinge seems to be evinced in this respect among the Nagas by the rule that the head of a tuskless elephant is useless! The head-tree of the neolithic period was only a symbol of the display of heroism for woman's hand. In later days the *modes* changed but the spirit was the same.

The neolithic age saw not only the complications of social life but those of economic life. The men became divided economically into different classes. Different crafts like those of the carpenter, the stone mason, the potter, the weaver, the dyer, etc. became common. There arose the village economy with its economic self-sufficiency. There was a growth in the standard of life. The economic and social forces were inter-twined. Consequently things like food, raw materials, nature of the soil, hunting facilities, had enormous influence on the size and density of the village groups. Terrace cultivation, weaving, stone-work, wood-work, etc. had their influence. There arose traffic by barter and a crude currency.

NEOLITHIC POTTERY

It has been already said that the neolithians invented the art of making vessels and other things from earthenware. No *exclusive* site of pottery works has been brought to light in India; but there is no lack of pottery finds in the midst of other neolithic finds. The types of neolithic pottery can be divided, from the surface standpoint, into two classes, namely the *plain* and the *decorated*. The plain variety again may be rough, smooth, polished and painted. Similarly the decorated group may be divided into (1) those which are impressed, (2) those that are moulded and (3) those that are incised. The last is the easiest to be produced but, curiously enough, the least common. From the standpoint of form, it is difficult to classify the neolithic pottery into definite patterns or types. We find an endless variety, almost all of which exist in the present day. Vessels in the form of modern lotahs; chatties with narrow or broad mouths; melon-shaped and wide-mouthed bowls; pots of different breadths and heights; conical-shaped, flower-pot-like patterns; vessels with round or truncated bases; vessels with three or four legs; water-jars, sprouted and unsprouted; discs of game or utility;—all these show the skill, the breadth of mind and the zest in life which characterised the neolithians.

The neolithic potter with his wheel is a live crafts-man in India. So far as colour is concerned, we find an agreeable and surprising variety. By choosing different kinds of clay, by firing to different degrees and by applying special pigments, the potter made varietes of the red, yellow and brown vessels. Orange and purple-grey are rarer. Specimens of red haematite earth from which colours were washed out have been found in more than a dozen sites in the Dakkan and Behar. Palettes for grinding rouge have been discovered at Bellary and Maski. There were apparently no pigments for producing the green and blue. The vast majority of the neolithic pottery are black in colour, consequent probably on the limited firing to which they were subjected. The libation vessels of Karnul, for example, are in highly polished-black.

One remarkable feature in regard to the antique pottery of South and West India is the absence of the delineation of the human figurines. Even animal figurines are comparatively rare. Further they are so ill-shaped and executed that it is often very difficult to say which animals are represented. The only exception is afforded by the pottery of the primitive tribe which once inhabited the Nilgiris, many of whose cairns were opened by J. W. Breeks, I. C. S. These people had a taste for making human as well as animal figurines, "all equally grotesque and some purely ideal inventions of the artists." A few represented the real animals of the plateau. Bruce Foote notes the curious fact that there are no figures of the fish in these representations, and explains it on the ground that either there were no fish in the hill streams of that age or they were *taboo* to the people who executed them.

The fact is, the Indian neolithians seem to have chosen the representations of *natural objects* like leaves, flowers, etc. in preference to those of men and animals. Patterns of leaves, of fruits, of flowers, in the form of fillets and pinnate impressions, have been discovered in a number of places. The Mysore pottery, for example, are richly decorated with impressed patterns of pinnate or, bi-pinnate fronds combined with linear bands raised or sunk. Others have fillets of dots or pitlets or trellis work painted on the sides. " In hardly any case is a pattern produced in duplicate and there is also great variety in the shape of the lips of different vessels and as well as in their sizes." Flanked sides, vandyke and key-hole patterns, raised festoons, tracings of star models, purple stripes and other coloured bar-paintings, and other decorations are met with. The neolithians adornedt heir implements, posts, everything which could be adorned. In the superior pottery of Tadpatri even the oven is adorned " with a raised fillet of finger-tip impressions near the base." The round medallions of this locality are decorated with fillets of low cones moulded upon them. The new stone men of India were certainly not wanting in artistic taste or imagination.

It may be added that Bruce Foote gives 127 localities where pre-historic potteries have been found in India. Of these, 56 he places in the neolithic age, 2 in the transition period between the neolithic and iron ages, 60 in the iron age and 4 in the proto-historic period, the remaining 5 being undetermined in age. The neolithic pottery have been chiefly gathered from Sawyerpuram in Tinnevelly; the Shevaroy hills; Srinivasapur, Kalidurga and Somnathapur in Mysore; the hills of the Ceded Districts; and a number of places in Hyderabad, Baroda and Kathiawar. Baluchistan has given one example, as has been already said. It is very difficult to fix the relative chronology of these in scrupulous exactitude; for very often remains found in one site need not show that that site actually produced the original fabrics. On the whole, those pottery which are dull in colour, rough in surface, and poor in decoration are assignable to the neolithic period, while those that are distinguished by rich colours, highly polished surfaces or elaborate artistic decorations or mouldings, belong to the iron age. There was thus a gradual and continuous evolution in the potter's art, till it reached a stage of very real beauty. "This was probably," says Bruce Foote, "before the great Aryan invasion, under which the potter's craft came to be despised and neglected, as it is nowadays to a great extent, as evidenced by the great plainness and often absolute ugliness of the present day pottery."

A noteworthy point in comparative study is, there has not been available in West or South India that peculiar pottery known as the celadon-ware which is met with largely from Karachi to Babylon and from China to Arabia. This type is generally of pale-green colour and often beautifully and remarkably glazed. It is believed in Afghanistan to reveal poison by cracking in its presence. It is considered to ensure luck to its possessor. It is not known when it was introduced into Sindh. It might have been, according to some scholars, brought by the Brahuis. But the question remains unanswered.

NEOLITHIC CARVING

Neolithic India has not produced any rich specimens of sculptural art. We have only one instance of the art, in the Kupgallu hill, Bellary district. It consists of some graffiti or rock-bruisings "which are really rough sketches of human beings either in groups or singly over and above many figures of birds and beasts. The performance indicates various degrees of merit." The figures moreover cannot, strictly speaking, be regarded as sculptures, for they are too little raised to be considered bas-reliefs. They are, as has been already said, mere rock-bruisings. These rude, rare, hammerings are found only in places where the trap rock shows an upright and tempting surface. The Kupgallu figures include a bustard (a type of large running bird) looking to the left, two elephants standing tail to tail, a bird with a big tail and thin body, a bull with high hump and lyrate horns, a human being running toward a bull's neck; and several obscene figures indicating the naive simplicity of these primitive folk. Two of the most elaborate pictures are thus described by Bruce Foote: One "shows a very small bull looking to the left. Behind him are two figures of men advancing left and holding round shields. Their right arms are up-raised as if hurling javelins, but the weapons are not shown; a round shield-like disc floats in the air. In the left-hand corner appears a small short-tailed animal with its head erect. Behind it (to the right) are a *lingam* and a crouching bull of a very modern type, and over it a tiger whose head does not come into the picture." Another set include a six-rayed star, a human figurine standing against the trunk of a tree, two rows of skeleton men marching on the top of a tree which bends at right angle and another set of five rows of marching skeleton men.

FUNERAL URNS

One very interesting feature in Indian neolithic (and subsequent early iron age) pottery is the existence of a special branch of the industry, namely, the manufacture of hot urn for funeral purposes. These urns are sometimes very similar to those found in the Alban lakes near Rome and in Etruria. They were intended for the accommodation of the bones or more often the ashes of the dead after cremation. The urn seems to have been regarded as the reproduction of the hut or cottage; for they are often provided with a little door secured in its place by a rope passing through two holes or by bolts passing through rings. Such urns have been found at Maski, Salem and elsewhere. They have persisted even to the present day, as Bruce Foote points out on the basis of the evidences from the Baroda State and other regions. The urns are sometimes very big in form. They are either legged or unlegged. The former bear a close resemblance to the pottery discovered in the Hissarlik ruins of Troy by Dr. Schliemann. "The Trojan vessels," says Bruce Foote, ". however differ somewhat from the Indian ones in that they are rounder and plumper in shape and have only three feet and never four, and are moreover furnished with loop-handles which are unknown in Indian pottery." Further, legged vessels of different sizes have been discovered only in the districts of South India or Mysore. One has been discovered in South Hyderabad also; but they are not met with in Gujerat, Kathiawar or further north. The legs of these funeral urns are usually three in number; but sometimes there are four. They are either tall or short. An aberrant variety of the latter is one with a short body and thick, elephantoid legs. Some of the urns or earthenware coffins discovered in the south, points out Mr. P. T. Srinivasa Aiyangar, are four feet in length and two and a half feet in diameter. He further notes that the neolithic urns are oval in shape while the iron ones oblong, besides being divided into square compartments with a hole in the centre.

THE NEOLITHIC RELIGION

The neolithians made great progress in the sense of religion. They were animists like the palaeolithians but with more settled and definite views. Believers in the cycle of life. in re-incarnations, they were the worshippers of ancestral spirits. Their worship of these is best illustrated in the large number of megalithic tombs they have left. Thousands of cairns or kistvaens, dolmens or menhirs and cromlechs have been found in all neolithic areas. They indicate by their similarity to the megalithic monuments of the other parts of the world the unity of the neolithic culture. The terracotta sacrophagi of Pallavaram have been compared to those at Bagdad and Etruria. The *Svastika* figuring in Mysore is exactly like that found at Troy. In India, as elsewhere there arose elaborate mortuary rites. The earthenware vessels used in connection with the funeral rites were subsequently broken and deposited side by side with the funeral urns. The idea was that these fragments were too sacred to be exposed and should be with the receptacle of the last remains of the dead. No neolithian burials by inhumation have been discovered in India. We have no evidences therefore to show whether the custom of of painting the bones of the dead in red colour as in the pre-historic caves of Italy, prevailed in India. There is no doubt however that the vague ideas of the soul, of re-incarnations, of the spiritual causes and remedies for sickness and other ills, and many other features can be traced to this age. Many rites connected with birth, naming, marriage, deaths, food-quests, etc., are neolithian in origin. The control of the mind over the body, of the invisible powers of nature over man, led to rites on the occasion of almost every secular act, individualistic or communal. Many elements in modern superstitions, the *taboos* on men and things, legends, mythology, folklore, not to speak of arts like poetry and dance, can be traced in their germs to neolithian spirituality.

One way in which the neolithic animism displayed itself was in the worship of stones. Peculiar shaped stones came to be regarded early in human history as embodying peculiar spirits. In Melanesia a man seeing a stone like bread-fruit would bury it near breat-fruit tree and if, through a favourable season, he gets an extra crop, he is satisfied that the stone has the spirit in it and has made the tree yield better. Hence stone is an object of worship, a heir-loom in his family. This perhaps is only a survival of a neolithic institution. An examination of the hill-tribes of India and even the more civilised castes shows its existence in the present day.

The worship of the phallus was, to judge from the neolithic finds, a common feature. There is no question that the later Aryans were first opponents of this worship but afterwards, with characteristic spirit of compromise, incorporated it with their system of worship. This is illustrated by the description of the phallic god as the enemy of Indra in the Rig Veda but the object of hymnal propitiation in the Adharva-Veda. The fundamental feature of saivitism — the erection of a temple over the phallus— is thus a neolithic legacy. It should be remembered that even in later advanced religion stone (or wood) has been regarded as holier than metal. The original idol is not in metal but in stone or wood. This is an indication of the comparative lateness of the metallic age. The large part played by the stone at the sacrificial altar in later Vedic sacrifices also shows this. The *yupastambha* of the Vedic priest has to be in wood. Wooden vessels and earthenware pots are even now regarded as holier and less liable to pollution than metallic ones and therefore prescribed for *Sanyasins*.

The neolithian propitiated the objects of his worship by offerings and sacrifices. The offerings were generally in the form of food, flesh and drink. The objects of sacrifice were various animals. From the discovery of skull cups we have to infer that human sacrifice was very common. The stone-dragging ceremony was attended with bloody orgies like the sacrifices of buffaloes (as in some communities) or men. There were equally sanguinary ceremonies whenever they went on chase or began cultivation or removed to another pastoral area. The rites were individualistic in some cases and communal in others. Some were for the general welfare of the community, others for that of the family. Some concerned agriculture and other occupations, some illness and so on. There is no doubt that omens were important causes of action or inaction in these operations. Much literature has gathered round the influence of dreams and omens on early progress.

To the neolithic times must be attributed the first rudiments of astronomical knowledge. It is evident that the neolithic tribes determined the time for sowing grains or for other religious or secular purpose by taking observation from the shadow of vertical sticks. It is very probable that they also noted the stars as a constant acquaintance with nature must have promoted such opportunities.

SURVIVALS OF NEOLITHIC LIFE

We may now conclude this chapter with the interesting question, what became of the neolithians? The answer to this question seems to be two-fold. Some of the neolithians or at least those who were driven to the hills and mountain fastnesses by later invaders or civilized people are even now intact and leading the life which they had been familiar with thousands of years ago. The aborigines of the different parts of India can be traced to them. They consist of (1) the pre-Dravidians, (2) the Mundas and other Kolarians and (3) the Dravidians who, for various reasons, failed to be civilized like the majority of their race and remained in the primitive stage of culture throughout the centuries which followed. The Census of 1921 estimates these aboriginal tribes at 16 millions. They are most numerous in Assam (248 per 1000); Berar (204 per 1000); Behar and Orissa (62); Bombay (82) and Madras (32). Numerically, the following figures give their comparative strength :—

The Gonds	29,02,592
Santals	22,65,282
Bhils	17,95,808
Kurumbas	8,55,279
Oraons	7,65,680
Banjaras	6,51,927
Kandh	6,16,824
Mundas	5,93,839
Saivaras	4,75,868
Hos	4,40,174
Nagas	2,20,619
Kachari	2,07,266

The Gonds live in the wide area stretching from Assam to Hyderabad. The Santals occupy Bihar and Orissa, Madras and Central India. The Bhils are the aborigines of Bombay, Central India, Baroda, and Rajputana. The

Kurumbas belong to Coorg, Madras, Hyderabad and Mysore. 'The Oraons are the natives of Bihar, Bengal, Orissa, Assam and the Central Provinces. The Banjaras are seen in such widely-spread areas as the Panjab, Central Provinces, Bombay, Hyderabad and Mysore. The Kandhs are confined to Bihar and Orissa and Madras, the Mundas to Bihar and Orissa, Bengal and Assam; the Savaras to Bihar, Orissa, Madras and Central India; the Hos to Bihar and Orissa; and the Nagas and Kacharis to Assam. There are numerous other local tribes (*e.g.* Enadis, Chenchus, Todas, Kotadis, Irulas, Kadirs, etc.) less in number but of equal importance. It is not possible to exhaust the list here.

These tribes, driven into mountains and jungles, live even to-day the life led by their ancestors. Naturalised in their wild homes they see in the plains, regions of disease. Outside their mountains and jungles they sicken and die. The forests supply them with their necessaries, except when they have not come into contact with civilised communities. With their simple bill-hooks they build their thatched huts, dam streams, construct rafts, make combs out of bamboo material and construct fishing line. Their dress consists of barks or leaves of trees. They use for ornaments shells, painted wood, leaves, bones and stones. The forest tribesmen kindle fire on dry wood from a flint and the floss of the silk-cotton tree over which particles of charcoal are rubbed. Fire-making has elaborate ceremonies and processes. They are excellent trackers and climbers, experts in setting traps for beasts and birds in sports and in game. They are of course flesh-eaters. Besides roots and bamboo seed, they eat the flesh of sheep, fowls, rock-snakes, deer, rats, pigs and monkeys, though there are totemistic restrictions in each case. Some primitive tribes still live in caves or under trees, but the more advanced tribes live in huts made of bamboos deftly split and thatched with leaves of trees and in big villages. The huts of some tribes are really comfortable with partitions and verandahs. Many are of course nomads and live in small groups, shifting from place to place when one spot becomes dangerous from disease, wild beasts or unproductive game. Even when they came to learn the art of cultivation, they as in the case of the Kanikars, have remained nomadic (*jhum*, as it is called). In religion they are pure animists and fetish worshippers. As Sir Herbert Risley says: " they worship and seek by all means to influence and conciliate the shifting and standing company of unknown powers or influences making for evil rather than for good, which reside in the primeval forest, in the crumbling hills, in the rushing river, in the spreading tree, which gives its spring to the tiger, its venom to the snake, which generates jungle fever and walks abroad in the terrible guise of cholera, small-pox or murrain." Trees and devils, serpents and spirits, everything malignant in nature, is an object of worship through magical rites and sacrifices.

While a large section of the neolithians still continue in their original condition in the mountains and jungles of India, the substantial portion of them remained in the plains and developed into the later civilized peoples of India. It is out of them that the population of India has in the main developed. The proportion of the Dravidians who must have considerably outnumbered the pre-Dravidians and the Mundas, who were completely local and failed to rise above their primitive levels of culture, in the existing population of India is not exactly known. There is no doubt that it is stronger in the south than the north. There are different degrees of the Dravidian blood amongst the different peoples of Hindustan or the south. The Mongoloids, the Monkhmers and the Aryans have contributed to the formation of different degrees of social and cultural mixture. But allowing for all these things it is the opinion of some that the substantial portion of the Indian population is Dravidian. Scholars like P. T. Srinivasa Aiyangar uphold that even the Aryans were mere descendants of the Dravidians and became estranged from the latter only by the adoption of the fire-cult and the priestly language of Sanskrit which belonged to the Indo-German family. It is rather too difficult to believe how a section of the same race could have adopted a foreign language for its own religious purposes. It is also difficult to believe how one section suddenly developed fire-cult as against the majority of their own flesh and blood. The differences are so radical that the theory of absolute ethnical identity seems to be impossible. The confusion is worse confounded by the statement of Mr. P.T. Srinivasa Aiyangar himself that the fire-cult was introduced by a section of the 'Aryans' from beyond the Himalayas. It is rather difficult to believe how the Aryans could have been the autochthons if they owed the most valuable of their cults to a foreign clan. The fact is, the Aryans and the Dravidians originally belonged to the same race—the Mediterranean—but they belonged to different stages of culture and further became differentiated by the mixture of the Dravidians with pre-Dravidians and by different climatic environments. This will explain both resemblances and the differences between them.

THE QUESTION OF LANGUAGE

It is the contention of many scholars that the nucleus of the vernacular tongues of Hindustan is not Sanskrit as it is generally supposed but the old Dravidian. The theory of the Aryan vernaculars, it is argued by this school, is incorrect, and it is maintained that it would be more correct to regard them as originally Dravidian in structure and later on subjected to the influence of Sanskrit. " A comparative study of the north and Indian South Indian dialects reveals the fact that their fundamental grammatical structure is so very much the same that it is possible to translate from one of these languages into any other by the simple process of the substitution of one word for another, a procedure absolutely impossible when translations are made from Sanskrit or English into any of the spoken dialects of ancient or modern India." Excepting the primitive Nishadha language of the Vindhyan region, says Mr. P.T. Srinivasa Aiyangar, all the languages of India must be traced to one original family of languages, and this original family is not the Indo-Germanic but indigenously Indian, coming from the neolithic times, ' if not earlier '. The large proportion of *desiya* words in every one of the so-called Aryan dialects, he asserts, shows descent from such a pre-Aryan 'pan-Indian' group.[1] Sanskrit was only a language of the priests, a sacred dialect invented by a special class for a special purpose and not a spoken language or vernacular at any time. Its influence was indeed considerable on the indigenous non-Sanskrit family in North India but its direct influence in South India from the uncultivated Kui to polished Tamil was small. All spoken dialects of modern India, in other words, are descended from one indigenous linguistic group of which Tamil is the most ancient and faithful representative. For, "in the most ancient layers of the Tamil language can be discovered not only ample traces of neolithic culture but also the birth of the iron age culture which succeeded it."[2]

To understand this contention it is necessary to form an idea of the general character of the Indian languages and their relation to each other. The Indian languages have been divided into four main types, namely, the Austric, the Dravidian, the Indo-Aryan and the Tibeto-Chinese.

The Austric family of languages was originally very wide-spread and covered the extensive region from Madagascar to South America, from the Punjab to New Zealand. The Munda languages spoken by the Mundas, Hos and other Kols who are in Santal Parganas, Central Provinces North Madras, etc. and who, as we have already seen, were probably the predecessors of the Dravidians in the development of Indian culture, belonged to this type. In later times the Munda languages were overlaid by Dravidian and other linguistic groups. Closely akin to the Munda are the languages called Mon-Khmer. They now occur in the hills of Assam, Upper Burma, Lower Burma, Annam, Cambodia Nicobar islands and Malay Peninsula. It is believed that these also are the surviving representatives of the Austric family. In India and Burma they occupy a quite insular position pointing to neolithic times.

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[1] See his *Stone Age in India*, p. 44.

[2] *Ibid*, p. 42.

The position of the Dravidian group of languages can be understood from these figures :—

Tamil	17·4 millions
Malayalam	6 „
Kanarese	10·4 „
Tulu	·53 „
Kodagu	39000
Toda	805
Kota	1300
Kurux	·609 million
Mallo	60700
Gondi	1·125 million
Kui	·49 million
Telugu	20·6 millions
Brahui	48589

Of the above, Tamil and Malayalam are dialects of the same branch. Kanarese and Tulu are as closely related to Tamil as to Telugu. The small languages of Kodagu, Toda, Kota, etc. are intermediate between Tamil and Kanarese. Gondi and Kui approach Telugu which branched from the common stock at a very early period though not perhaps so early as Tamil. Brahui is completely isolated by its environment and while the race speaking it is completely un-Dravidianised the language has been considerably influenced by other surrounding languages.

Now, the Dravidian group was affiliated by Bishop Caldwell with the Turanian pre-Aryan languages which afterwards gave rise to Turki, Finnish, Laplandish and other allied languages of Europe and Asia. Others have denied this connection and identify it with "the Munda family, the Tibeto-Burman languages and the dialects spoken by the aborigines of the Australian continent." The arguments adduced in favour of this however, in Sten Konow's opinion, have not proved to be sufficient. He believes that "only the Australian hypothesis can still lay claim to some probability" and that "till it has been more closely tested, we must consider the Dravidian family as an isolated group of languages with several characteristic features of its own." (*Encyclo. Brit*).

The third great group of Indian languages are the Indo-Aryan, to which Sanskrit and the majority of the vernaculars of North India, according to Grierson and others belong. The oldest form of the Indo-Aryan language is that of the Rig Veda. It is believed that it was already distinguished from the oldest form of Iranian and the Indo-European languages by the adoption of some new letters, namely the so-called cerebrals, from Dravidian. The Indo-Aryan languages of India radiate from a central area, the country of the Kurus and Panchalas, which was the original home of the Brahmin speech, Sanskrit. From there it spread gradually, throughout the whole of India, receiving a check only in the Dravidian strong-hold of the south. Immediately south of the original home of the Brahmanical speech, there is a land of languages called 'Midland languages' of which western Hindi is the most important. Outside the region of midland languages, there is a band of allied tongues, *viz.*, Punjabi, Rajastani, Gujarati in the west; Pahari on the north; and Eastern Hindi in the east. Beyond this chain of languages there is an 'outer band' of allied languages, *viz.*, Kashmiri, Sindhi and Kahchi in the west; Marathi in the south-west; and Bihari, Bengali, Assamese and Uriya in the east. The Indo-Aryan linguistic area can be thus divided into three belts (1) a central, (2) an inner, and (3) an outer band of languages. The Dravidian element is in different degrees in the different bands. It is believed that these vernaculars were developed through the intermediate stages of prakrits (primary and secondary) from Sanskrit, as the result of the mixture of the latter which the old Dravidian or other popular tongues.

The relation between the Dravidian and the Indo-Aryan or Sanskrit languages has always given rise to controversy. Dr. Caldwell and others supposed that the Dravidian group was anterior to Sanskrit, that it has always possessed a vitality characteristic of an original group and that it has been capable of expressing the most fundamental things without the necessity to borrow words from Sanskrit, while in grammar it possesses complete originality characteristic of a language of independent formation. They point out that, while all other languages have given way to Sanskrit whenever they came into contact with it, the Dravidian group has not only been able to withstand it but even compel the Aryans to adopt Dravidian for their spoken tongue, and even contribute certain elements to archaic Sanskrit, to Prakrits, and to 'the Aryan vernaculars.'

The theory that the Dravidian group is completely independent of Sanskrit has been disputed of late by Mr. R. Swaminatha Aiyar, Reader of the Calcutta University. This astute scholar points out for instance how 60 words which Caldwell mentioned as pure Tamil and indicating the originality of Dravidian, can in reality be traced to Vedic Sanskrit (which should be distinguished from classical Sanskrit or Samskrita). The mistake committed by Caldwell, he points out, is that he compared these Tamil words with the words of classical Sanskrit and not with those of the old Vedic Sanskrit. If he had compared them with the latter, points out Swaminatha Aiyar, Caldwell would not have arrived at the determined conclusion that the Dravidian family was entirely different from the Indo-Aryan. The following examples will illustrate the point.

Tamil words.	Sanskrit words with which Caldwell compared them.	Vedic words with which they should be compared.
Mayir	Kesa	Smasru
Sevi	Karna	Sravas
Vay	Mukha	Vach.
Kan	Akshi	Akshan
Iravu	Nakta	Ratri
Ti	Agni	Tejas
Ur	Grama	Pur
Erumai	Mahisha	Sairibha
Vel	Sukla	Svitra
Peru	Mahat	Brihat

It is clear from the above that even such important words for representing the mouth, the nose (*mukku* being the same as *mukha*) and place (*ur* being another form of *pura*), were not purely Dravidian but common to it and the ancient pre-Sanskrit, Vedic tongue.

Swaminatha Aiyar has similarly traced hundreds of Tamil words belonging to different departments of knowledge and activity to Sanskrit or Prakrit (like the Paisachi). Swaminatha Aiyar has gone even further and tried to prove that very many of the alleged grammatical peculiarities regarded as indicative of Dravidian originality[1] (e.g. pronouns, demonstratives, relatives, etc.) can be traced to Sanskrit influence.

SOME NEOLITHIC ELEMENTS IN MODERN CULTURE

We may now rapidly glance at the many survivals of the features of the neolithic culture. As has been already said, all later civilization has been built upon the neolithic. Hence the neolithic customs and institutions have given way to other customs and institutions. But even amongst the great developments of civilization we find many remnants of neolithic beliefs, customs and superstitions. In the field of religion it is seen conspicuously in fetichism, in the worship of material objects inspired by the notion that they possess supernatural powers. The idea that people can be 'possessed' by spirits, good and bad, that spirits can be initiated into and expelled from foreign bodies by magical rites, the employment of spirits for material objects are all due to the neolithian animism. In fact, the installation of animals, stones, images, the *phallus*, the *salagram* and tools as objects of worship can be traced to the neolithic culture. The use of amulets, beads and sacred threads, sacred ashes, shells, stones with words for the eradication of disease, etc. can be traced to the same source. The use of broken pots and scare-crows for averting evil eye, the belief in metampsychosis and the transformation of good spirits into gods and bad spirits into devils, the theory of the temporary migration of souls to stones, animals, trees, and birds, the worship of manes and the demons, the performance of sacrifices, the use of magical inscriptions, the practice of witchcraft and astrology and many more points give a clue to the primitive notions in the midst of later cultured life. The rudiments of idol-worship, the attribution of the weapons like the mace, the bow and arrow to the deities, the idea of the purity of stone and wooden things when compared with the metallic ones (the latter being more subject to pollution) and the consequent preference of stone or wood for the original idols of temples etc. have neolithic origin. Many features in Saivitism and Vaishnavism can be traced to primitive ages. The phallic emblem referred to in the Vedas first as the enemy of Indra and later Vedas as a subject of hymns shows the nature of the development of Brahmanism. Much of the underlying conceptions of Siva and Rudra is neolithian, Krishna again who figures as an aboriginal enemy of the Aryas and afterwards becomes the Bhagavan of the Bhagavata cult was a pre-Aryan hero or deity. The association of Krishna with the cowherds and of his brother Balarama with the plough and liquor is surmised by Mr. P. T. Srinivasa Aiyangar to give a clue to the original combination of the pastoral and agricultural functions. Krishna with his flute, the earliest musical instrument of man, and his milkmaids, was a prestine deity. Similarly several features in the cults of Vishnu, Kali, etc., can be traced to pre-Aryan influences.

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[1] See *The Proceedings of the First and Third Oriental Conferences* besides the valuable booklet in Tamil called தமிழின் உற்பத்தி, reprinted from the *Tamilian Friend*. Mr. C. Narayana Rao of the Anantapur College has just published a valuable treatise showing the basis of the Dravidian tongue on Prakrits.

Again, the mud and ma-thovels of the wandering castes, the scanty subsistence on pounded grain, the meagre dress, the use of sun-burnt bricks (as in Egypt, Babylonia, etc.), the system of false arch (which prevailed in ancient Egypt, Greece, Italy, etc.) the non-existence of furniture, the use of leaf plates; the eating with the fingers; the clothing in rags prevalent in some castes; the use of cotton only for the waist; the scanty dress of all classes; the custom of piercing the ear and nose ; tattooing ; the widening of the lobes of the ear (as in Africa): the piercing of the cheeks with pikes by mendicants ; the lip-cutting among the female beauties ; the primitive-handicrafts; the simple potter's wheel (which was the same as that in vogue in Ancient Egypt, Palestine and the West); the primitive methods of spinning and fishing the latter being carried (with artificial dams, nets, stones, stakes and baskets and by draining the tank-bed and channels for the purpose of catching fish); the simple character of the *catamaran*, the sewed boat and the chatty float (as in Ancient Egypt and Babylon); the primitive system of medicine and magic; and a hundred other institutions, beliefs and practices are neolithic survivals. Even in the most advanced societies some of the domestic implements are still neolithic. Superstitions like the adoption of good names to hide bad qualities, the use of private and secret names, the female custom of not mentioning the husband's names are some neolithic superstitions about names. The belief in omens, good and bad, belongs to the same category. The good omens on the whole seem to be the sight of animals familiar to savages like virgins, flowers, married men, etc. Bad omens like widows, Brahmans, Komatis, *pujaris*, serpent, sickle, rain, wind, the hunter, etc. indicate something injurious or unfamiliar to their interests. The movements of kite, deer, hawk, mongoose, squirrel, dog, cat, etc. play a large part in modern omens on account of their familiarity in early life.

CONCLUSION

The greatest danger to the neolithians is that of extinction in consequence of the influence of missionaries and other civilizers. The activities of the latter have killed some of the cherished and wholesome institutions and caused degeneration in the society and race. Vices which the primitive people had never known have begun to ruin them. What Rev. W. Dane says in regard to the Fijians is quite applicable to India. He says: "The dangers are to be seen in the possibility of extinction arising from indulgence in vices unknown to the natives before . . . Lassitude and laziness may yet prove fatal to many, both in social life and moral character. Disintegration of classes is also surely setting in; for gradually there is coming into view a richer and a poorer class, a law-breaking and a law-abiding class, and a religious as against a sceptic section of the community." Rev. Deane shows that the custom of the sexes living together in one house which often consists of a single apartment accounts for a great deal of impurity—a danger which was minimised in the earlier days by the system of special village houses for the men into which women could never enter. Similar is the case in India. Civilization is putting an end to the race, the sociology and the psychology of the primitive tribes. Many tribes like the Sabaras and the Lurka Kols who erect dolmens and menhirs even to-day as in neolithic times are being so rapidly civilized that their beliefs and institutions are about to become survivals under strange environments instead of intact realities.

BIBLIOGRAPHY

The materials for the anthropological and ethnological studies of India are very copious, though still much remains to be done. Almost the first scientific work was that of Risley. He took measurements of 89 castes of Bengal, the United Provinces and the Punjab and published a summary of these in 1890 in *the Journal of the Royal Anthropological Institute*. These measurements were approved by Flower, Topinard, Schmidt and other famous European anthropologists. It was these studies that led to the classification of the people as Aryan, Dravidian and Mongoloid. Col. C. H. Charles carried on similar researches in the Punjab. Thurston did great work in Madras, besides correlating the views of original writers like Haeckel (author of *The History of Creation*), Wallace (the author of *the Malay Archipelago*, 1890) Skeat and Blagden (authors of *Pagan Races of Malay Peninsula*), Preuss, Virchow, Anandale, Oldham (author of *the Manual of Geology* in India, 1893), Huxley, Lapicque (who like Schmidt is an authority on South Indian anthropology) Lydekker (author of *Introduction to the Study of Mammals*, 1891), Topinard, Semon, Keane, Macleane, Turner (the author of *Contribution to the Craniology of the People of the Empire of India*, pt. 11, wherein he maintains that there is no cranial resemblance between the Dravidians and the Australian aboriginals) Lyall, Grierson and a host of others. Similarly, T. E. Holland has carried on anthropometrical work among the Coorgs, Yeravas and the Kanets of Kulu and Lahul. Samanta and Gupte have done much in the investigations of the peoples of Baluchistan, Rajputana, Bombay and Orissa; Waddel has done similar work in Assam and Bengal; and Ujalvy and Stein in N. W. India. Dr. Eikstadt has collected immense materials of late to be still worked up. He holds that there are three kinds of black races in India, namely, the Kolis of the north, the Vedahs of Ceylon, and allied tribes of South India and the Melmoids, a type found in the lower castes of many parts. He does not grant the presence of the Negrito element in Indian population though he concedes its presence in the Vedoid race. Among the scholars working at present, the names of B. S. Guha and Chatterji (See *Modern Review*, December 1924 for some of his views) deserve prominent mention. The former's presidential address before the 15th Science Congress (given in the *Modern Review*, August 1928) is an excellent resume on the present problems. A comprehensive treatise on Indian Anthropology is yet to appear.

General treatises on the evolution of early culture and their survivals are too numerous to be even barely mentioned. Among them may be noted: Rivers' *Dreams and Primitive Culture*, *Instinct and the Unconscious*, *The Disappearance of Useful Arts*, *The Sociological Significance of Myths*, etc., which are indispensable for understanding primitive psychology and practical life; Marett's *Anthropology*; Lang's *Anthropological Essays presented to E. B. Tylor*; McDougall's *The Group Mind*; Keith's *Antiquity of Man*, *Nationality and Race*, *and Engines of the Human Body*; Haddon's *Study of Man*; Gomme's *Ethnology in Folklore and Folklore as an Historical Science*; Tylor's *Early History of Mankind* and *Anthropology*; Edward Clodd's *Primitive Man;* M. I. Newbigin's *Man and His Conquest of Nature;* Frazer's *Totemism and Exogamy*, *The Golden Bough* and other works; Webster's *Primitive Secret Societies*; Ridgeways' *Dramas and Dramatic Dances*; Lowie's *Primitive Societies*; Prof. Westermarck's *A Short History of Marriage* (1926) in addition to a number of monumental works on the subject; and numerous other works by different authors and journals like the *Bulletins of American Institute* of *Ethnology*, *the Journal of the Royal Anthropological Institute* and the indispensable pages of *The Nature*. A complete list has of course not been attempted here. Special mention should be made of the four volumes called "*The Corridors of Time* (Oxford, 1927) called *The Apes and Men*, *Hunters* *and Artists*, *Peasants and Potters*, and *Priests and Kings* which carry the history of human culture to the classical age.

Of the special works which concern India there are a large number. Among these may be mentioned Thurston's *Ethnographical Notes in South India* (a number of bulletins) and *Castes and Tribes of South India*; Anantakrishna Aiyar's *Cochin Castes and Tribes*; Col. Dalton's *Descriptive Ethnology of Bengal*; Crooke's *Popular Religions and Folklore of Northern India*; Rice's works on Mysore and Coorg besides the pamphlets issued by Nanjundayya of the Ethnological Survey of Mysore; G. B. Clarke's *The Outcastes*; Russell's *The Tribes and Castes of the Central Provinces*, etc. Gazetteers or Manuals like those of Upper Burma and the Madras Presidency are full of information on particular localities. Travancore is practically unexplored. Syed S. Hussan has done good work in the study of castes and tribes of Hyderabad, but much remains still to be explored. The Census Reports, the numerous volumes of the Linguistic Survey, and the Reports of the Geological Survey, are also indispensable mines of information.

A number of special treatises have appeared on the hill and plain tribes. Of these the following may be noted: Man's *Andaman Islanders*; Rivers' *Todas*; Saratchandra Roy's '*The Oraons of Chota Nagpur*; the same author's *The Mundas and their Country*; McCulloch's *The Naga Tribes of Manipur*; Shakespeare's *The Lushkai Kuki Clans*; Hutton's *The Sema Nagas*, *the Angami Nagas*, etc.; Hertz's *Practical Handbook of Kachin*; Soppitt's *Account of the Kachari Tribes*; Brown's *Account of Mannipore*; Mc Alpine's *Report on the Condition of the Southals in the Districts of Birbhum, Bankura, Midnapore and Balasore*; Rev. Hahn's treatises on the Kol missions; the Sarasin brothers' studies of the Vedahs, etc. There are special treatises on languages and vocabularies. Journals like those of the Bombay Anthropological Institute, the Asiatic Society of Bengal, *Man in India*, and the Bihar and Orissa Research Society, contain a number of very valuable articles, some of which have reappeared in the volumes above enumerated. The works of Perry, E. Smith and others higly valuable for compartive study, have been referred to in the footnotes in the previous pages.

A sound volume on the Indian primitive culture is that of Col. T. C. Hodson, a series of five lectures delivered in 1922 in the University of London (128 pp.). It is a good analysis, but a more comprehensive volume is needed, for which materials are available in plenty. The fields of anthropology, anthropometry, ethnology, folklore, mythology, etc. have to be correlated into a sound monograph which is sorely needed and which is in preparation by myself.

CHAPTER VII

THE ADVENT OF METALS

During the later centuries of the neolithic age, it is now conceded, the use of metals for various purposes in place of stone was discovered by humanity, though it is not possible to say when exactly it took place. We know that the neolithic men came across precious stones, gems, shining beads, etc., in the course of their flint-making, and valued them for ornamental and ritualistic purposes. Agates, carnelians and diamond have been even to-day discovered only near the settlements of the stone age men. The latter could never have been therefore ignorant of them.

To understand the various theories in regard to the early history of the metals, one thing is absolutely necessary, namely, that it was in the close of the neolithic and the commencement of the metallic age that the civilizations of Mesopotamia and Egypt began. The exact as well as relative chronology of the commencement of the civilizations is uncertain[1]. On the whole the Mesopotamian culture seems to be now regarded as the earlier. Scholars there are who trace the Mesopotamian civilization to about 7000 B. C.; but all are agreed that it was in the 5th or rather 4th millennium B. C. that these two cultures, so momentous in shaping the history of the world, became fully established. By 3750 B. C. the celebrated Sargon I established the Sumerian-Accadian Empire and inaugurated an era of Semitic-Sumerian culture which reaped great glory in the two millenniums which followed. The early dynasties of Egypt were practically synchronous and co-operated, in its own way, in the spread of human civilization over the various parts of the world. Historians like Elliot Smith and Perry have attributed the spread of Heliolithic culture, the culture of the sun and stone, throughout the world to the influence of Egypt. We shall presently study this question, incidentally detailing the complexities engendered by the activities of Babylon; but for the present the most salient, the most momentous fact to be noticed is that both these civilizations were able to make their remarkable progress on account of the use of metals for ritualistic, economic or ornamental purposes. Gold in particular was the elixir, the magical property which for the past sixty centuries has been the object of man's search and therefore the cause of the spread of civilization. "Whether one examines the distribution of the earliest monuments in Southern India or the settlements mentioned in the Rig Veda in the north-west," says Prof. E. Smith in a lecture before the British Association at Liverpool (14th Septr. 1923), "the distribution of ancient settlements in Persia, Siberia, the Caucasus and Asia Minor or further afield in the ancient East, in Europe and the British Isles, in Africa to the Niger and Zimbabwe, in the lands of gold in Malaysia and eastern Asia, and further still in America, we can read the same story, the same motive and the same result of the exploitation of the local natural resources by the native population under the direction of ruling and small bands of alien immigrants. Many other materials to which a magical or economic value was attached played a part in this process of exploitation. Resin, timber, pearls, copper, flint, jade, burquoise, lapiz lazuli, amber, tin, and eventually all metals, were some of the more obtrusive lures that impelled men to embark upon any adventure, however hazardous; and the search for these things was responsible for the world-wide diffusion of culture."

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[1] It is the general conclusion of modern research that the peoples who established civilization in Egypt, Babylon, Crete, the Mediterranean region and Britain belonged to the same ethnic stock—which had a homeland in west Asia or further west. Egyptian culture began under the first dynasty before 3,400 B. C. Kish the capital of the first empire in Assyria belonged to 5,000 B. C. (*Nature*, Sept. 19, 1923, p. 484).

GOLD

Of the metals, gold was apparently the earliest to be discovered by man, though of course it was used only for ornamental, not ordinary, purposes. The earliest lands to use it in the West were Egypt and Babylonia. The

Phoenicians became acquainted with it about 1500 B.C. and introduced it into Greece about 1300 B.C. Italy came to know it in the 11th century B.C. and the rest of Europe in different periods during the next few centuries.

It is difficult to say when India first came to use it. It is held by some that, as gold is, next to iron, the most widely distributed metal in India, and as the practice of washing the metal can be traced in this country to an unknown antiquity, India must have been the original discoverer of the metal. An additional argument in favour of this is that the quartz and schist of South India and Chota-Nagpur, where the neolithians polished their tools, are rich in gold and therefore must have become known to them. On the other hand, it has been suggested (for example by Gowland[1]) that, though gold occurs in the river sands and gravels, deep-shafted mines are seen only in a few places—like Wynaad, the Nilgiris, Mysore and Hyderabad; and that these remains indicate on advanced stage which, in his opinion, is an indication of external influence. On the whole, the probability is in favor of the Indian discovery of gold. The Indian has shown great aptitude for improvement in the methods of mining gold. Deep shafts have been sunk. Hill-sides have been scooped away and aqueducts constructed. Mines have been discovered at the roots of ancient and gigantic trees. The use of quicksilver for freeing the gold, and the technique for getting rid of the silver, etc., were known. When iron came into use its service was brought in. All these signs of continuous and adaptive growth seem to indicate that the craft of the Indian gold-workers was indigenous, and their skill was inherited from ancient times. Ancient gold workings have been found at Devala [2]; Pundat valley, Bishopsdown and Fernhill in the Nilgiris; and in various parts of Mysore and Hyderabad. Circular fort walls, rings of stone, ruins of extensive works and walls indicate, in the latter, extensive mining villages. 'Grigg believes that throughout the Nanjanad valley, the mounds of earth along the banks of the streams indicate that the soil was washed for gold. The Fernhill fort was, it is believed, constructed by gold-diggers. Many of these ancient works belonged, there is no doubt, to later periods; but they are not evidently exotic institutions. They seem to have had a pre-historic origin. Both the treatment of alluvial deposits and the exploitation of the ores prevailed in India, we may conclude, from the neolithic times.

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[1] "India at all times has been regarded as a land of gold ; yet the gold-bearing districts are almost exlusively confined to comparatively small areas in the south, so that the question naturally suggests itself whether the gold was obtained by mining or by external source." Gowland then surmises that the gold obtained by mining in the limited areas of India was probably exotic. His arguments are patently unacceptable.

[2] See Sewell's *Antiquities*, 1. pp 224-6 ; *Madras Journal* Vol. XIV, p. 97 ff., *Nilgiri Manual*, p. 243 ; Mysore *Gazetteer*, Vol I, p. 17, 49, and 58-9; and *Ibid*, Vol. II., p. 98.

An immediate question which will suggest itself at this stage is: If India was the first country to discover and use gold, what part of the country should be credited with it?" There is every reason to believe that it was South India that must be accorded that honour. The synonymous use of *pon* (or gold) for every metal in the Tamil land is an indication of the fact that gold was the earliest metal to be known in South India. As the author of the *Madras*[1] *Manual* puts it, *Pon* (gold) which originally meant any metal, was the national metal of South India in spite of its present scarcity there. The singular skill displayed in the beaten gold of the South Indian jewellery must be regarded as a demonstration of the great antiquity of the craft. The names '*sembon*' or red pon for copper, of *irum-pon* or black pon for iron and *ven-pon* or white pon for silver, are a clear proof of the indigenous origin of the gold industry. It is quite possible to argue that Pon was derived from the Sanskrit *suvarna* and *sembon* from the Sanskrit *tamra*, thus indicating an Aryan origin to the industry; but it is incredible that the pre-Aryans who were so skilful in flint-mining were ignorant of gold. It is more consistent with the probability of things that the Sanskrit word *suvarna* was derived from the 'Dravidian' *pon* and *tamra* from *sembon*. It is now acknowledged that the Aryans took

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[2] Vol. III, p. 692.

over the names of many Dravidian or pre-Aryan things but gave them Sanskrit etymologies and the vernaculars in their turn came to adopt these Sanskrit terminologies. It has very often happened that indigenous articles known to the Sanskrit-speaking people comparatively late are in consequence known by Sanskrit names to the great perplexity of the students of history. But such names are in reality from the strict historical standpoint anomalous; and mere Sanskrit titles cannot indicate an Aryan origin. It is very probable therefore that the Aryan *suvarna* was derived from a pre-Aryan term current in India.

If gold was a South Indian discovery, it naturally follows that the use of it for the first time in Egypt, Mesopotamia and Sindhu valley was probably due to the exportation of the metal from South India to those regions. The Aryans might have derived the knowledge of the metal from either the Mesopotamians or more probably the men of the Sindhu valley. That the Mesopotamian peoples were indebted to India for the use of gold is clearly proved by the Chaldean[1] inscriptions which say that the ships of the city of Ur, which went long distances brought gold from India (as well as Africa which however must have been indebted to India), and used it largely in decoration.

COPPER AND BRONZE AGES

Copper was, excepting perhaps gold, the earliest metal to be discovered by man. Further, while gold was used only for ornamental purposes, copper was the material used for tools and implements. It is probable that the art of smelting the ore and extracting the metal was originally an accidental discovery. As usual, the original place of discovery is shrouded in obscurity. Being naturally found in many regions it might have been discovered independently in several areas. The credit, however, has been usually though dogmatically given to Egypt. When once discovered, the superiority of copper to stone was appreciated by the neolithians and the copper age of human culture began. But copper age could not, by itself, be of long duration. Pure copper has got some serious defects. It is not easily fusible. It is not suited for casting. Further, it is too soft and malleable. A harder material is necessary for making the tools and implements. Necessity led to discovery ; and somewhere some ingenious man invented the art of making bronze, a compound of copper and tin (which was also known by this time), the first alloy to be used by man. The evolution of culture in many parts of the world has been practically from the quartzite age to the bronze age. The number of copper implements are therefore in these parts much fewer than bronze ones. In some, the copper age is even entirely absent, the bronze age immediately succeeding the stone age. On the contrary, in a few countries like Crete, Ireland, Hungary, Greece and Italy, the intervening copper age was comparatively long before the bronze age came in. It will be inferred from this that the existence and relative durations of the copper and bronze ages differ in different parts of the world. Bronze was, according to Prof. Sayce, introduced into Egypt about 2750 B.C. The Greeks and Romans never distinguished copper from bronze and so had the same names (*ans*) for both. The term *copper* came into distinct currency in Rome, which got her copper from Cyprus, and then spread to Western Europe.

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[1] That the Chaldeans developed largely the gold industry is proved by the remains found there. The report of Mr. Leonard Wooley, Director of the Pensylvania and British Museum Expeditions in Ur in 1927, for instance, states that the head dress of the buried queen Shubad was a marvellous work in gold "Coil after coil of gold ribbon surrounded a great wig above which, and across the forehead, ran a frontlet of lapiz-lazuli and carnelian beads, from which hung heavy rings of gold; and higher up a wreath of golden mulberry leaves surrounded by another formed by large flowers whose petals were inlaid with lapiz lazuli and white shell." The queen also wore gold garters and "over the upper part of her body was a cloak entirely covered with bead-work fringed with dangling golden rings. The cloth was fastened on the right shoulder with three pins of gold and lapiz Lazuli, on which was inscribed the queen's name." (*The Hindu*, February 14, 1928.

The advent of bronze age after a copper or quartzite age in the various parts of the world was characterised by some startling developments in human culture. The bronze weapons which have been thus far discovered are swords, awls, knives, hammers, daggers, arrow-heads, etc., and indicate a high skill in workmanship. The handles of many bronze swords show the figure of the *svastika* and the cross which seem to have been the earliest symbols to be constructively invented by man. The presence of amulets found in the remains of the bronze age indicates the practice of magic among the peoples of the period. One important change in the social customs of the people as compared with the stone age was the more general adoption of cremation. The barrows of the stone age are much bigger and more imposing than the sepulchral mounds of the bronze age, even though the latter were in use for generations. The urns of the age have been found full of bones, pottery, etc., the pots being adorned with dots, zigzags, crosses, etc. Another characteristic of the bronze age was that bronze was not the only metal to be used by man. There was a multiplicity of metals. Gold was used for ornamental purposes. Gold amulets, coronets, diadems, vases, have been found side by side with bronze ones in the barrows. Similarly silver, tin, lead, zinc and quick-silver came into use by side by side. Silver in its native state was discovered as companion to gold.

THE ABSENCE OF BRONZE AGE IN INDIA

In the major portion of the world, then, the stone age was followed, after an interval, long or short, of copper by the bronze age. The case of India, as that of China and the Slav world, is peculiar. She has had no bronze age at all. In South India, the stone age passed directly to the iron age; while in North India the stone age was followed by a copper age which in turn gave place, in course of time, to the iron age. Two facts seem to oppose this theory. Bronze objects, as many as 123, in the first place, have been found in the archaic graves of South India by Mr. Rea,[1] the Superintendent of Archæology. Secondly half a dozen bronze implements—a celt, a spear, a sword and three harpoons have been discovered at Jubbalpur and other places in various places of North India. Vincent Smith criticises both these arguments[1]. He points out that the bronze things found in the South Indian cemetries are objects of luxury used in a period subsequent to the Christian era, and do not indicate the existence of an age when bronze weapons were in use. Secondly, he doubts whether the six or seven things discovered in North India, were made of bronze at all. He is sure that only one of the Jubbalpur celts is clearly made of bronze and suspects that this might be accidental or of foreign origin. The conclusions of V.A. Smith have found support in Bruce Foote,[2] J.C. Brown[3] and others. Bruce Foote explains the absence of the bronze age in South India thus: "That the iron age in peninsular India was not preceded by a bronze age, as in Crete, Greece and so many other western countries, was very probably due to the land-loving character of the neolithic people; for, had they possessed any sea-faring inclinations, they would certainly have sailed across the Bay of Bengal, reached the Tenasserim coast and there become acquainted with the tin-stone (cassiterite) of that region. As copper is found plentifully in India, the art of making an alloy must soon have followed. As it fell out, however, the discovery of the alloy was not made in India till after the art of iron-melting had been acquired and iron weapon and tools had come largely into use." That the copper age is not peculiar to India is proved by the fact that in Hungary, Italy, Ireland, etc., there was such a period; only, in those countries copper gave way to bronze and bronze in its turn to iron, while, in North India, copper gave place directly to iron.

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[1] See *Tinnevelly Gazr.*, I, under Adichchanallur.

THE COPPER AGE IN NORTH INDIA

Concluding then that there was no bronze age in India we shall now proceed to study the characteristics of the copper age which, as we have already seen, followed immediately the neolithic age in North India. Copper antiquities have been traced in about a score of places in this region, nine of which are in the United Provinces, five in Bengal and Bihar, one in Baluchistan and two in the North West Frontier Province [1] In Bengal the district of Hazaribagh[2] has revealed a few primitive axes, half-formed and fresh from the smelters' hands, which could be handled with split bamboo or stick. The Jatibana paragana,[3] Midnapur district has given a highly finished flat celt or battle axe " with a rounded cutting edge ending in two well-marked shoulders continued down from the butt." The cutting edge forms a half circle. Celts have also been found at Karharbari, Baragunda and Saguna in Bihar.[4] In the town of Bithaur[5] near Cawnpore in the United Provinces, there was discovered as early as 1821 a remarkable copper barbed spear-head or harpoon. In the Mainpuri District[6] of of the same province, have been discovered a copper spear-head with a cylindrical lower end, a ridged blade and with sides like the edge of a saw with fine secured teeth ; a broad flat celt, similar to that found in North Europe,[7] with two slightly rounded cutting edges and sides slightly concave and convex, long, narrow thin celt ; six rings resembling bangles which might also have been 'ring-money.' In Fategarh near Farukhabad,[8] again were unearthed a set of 13 swords. Three of these are leaf-shaped. They differ, says C. Brown, " from the leaf-shaped swords of Europe in presenting no contraction along the blade from the tip to the hilt, and in their apparently having no wood on the handle, which was probably only bound with hide cut in strips. This part of these swords also differs from European weapons in having a point of considerable length projecting outwards between two and three inches from each side of the hilt. The edges are not very sharp, and in one there are two large gashes near the hilt. The shortest sword has the smallest handle much too small for an average man's hand. The mid-rib is well defined to the tip." The other sword has a tapering blade, "one cutting edge of which is rounded off into a handle while the other turns towards it at an obtuse angle." The mid-rib of this instrument is well-pronounced. The hilt is quite different from that of the other three, being larger and having only a short projection on one side of its proximal end, *viz.*, on the side on which one cutting edge forms an obtuse angle with it." One curious object discovered here is a human figure presumably used as a religious symbol or image, and somewhat like some later figures found in the Gaulish graves of Italy

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[1] *Ind. Antq.* for 1905.

[2] Notes, pp. 24-5.

[3] *Rais Catal.* p. 11.

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[1] In his *Commercial Products of India* Sir George Watt points out that copper was indigenous in the outer Himalaya from Garhwal in Bhutan and in Rajputana.

[2] See Coggin Brown's *Rais Catal.*, pp. 140-1 for details of the nature and history of the finds. It has been suggested on the contrary that these finds might be copper plates.

[3] *Ibid.* pp. 142.

[4] *Ibid*, p. 9-11.

[5] *Ibid*, pp. 142-3. based on *Assiatic Researches*, Vol XIV, 1822, App. 3, pt. 3)

[6] Brown's *Rais Catal*, p. 143 based on *Proc. Asiatic Soc. Bengal*, 1868 p. 262 & *Geology of India*, Pt. I, p. 443.

[7] *Ibid*, *Jour. Asiatic Soc. Bengal*, Vol. 48, p. 136.

[8] Brown's *Rais Catal.* pp. 144-6. *Ind. Antq.* Vol. 34, October 1905.

Passing on to the Central Provinces, we have to note a very important set of pure copper finds found in 1870 at a village called Gungthuria[1] in Balagpal district. They included as many as 424 things or pieces and had a total weight of 829 pounds. Together with them were found a set of 100 thin plates or pieces of silver—a mixture not unparalleled outside India. Sir John Evans describes them as "the most important discovery of instruments of copper yet recorded in the old world." The fact that such a large number of implements were found together, says Vincent Smith, "affords conclusive evidence that at one time the manufacture of implements of pure copper was conducted in India upon an extensive scale. It is impossible that more than 400 such implements should have been collected in a single deposit unless they were of a kind in common ordinary use." The copper implements are characterised by a very great variety of designs based on polished stone types. Most are flat celts of different shapes. Some resemble long crowbars, with chisel edge in the lower end. They have been called bar-celts. Some bear clearly the marks of the hammer by which they were beaten out. Some of them resemble those found in England, in Southern Babylonia, and in the Greek Archipelago. Many similar instruments, says Evans, "said to be made of copper, have been found in Austria, Denmark, Sweden, Hungary, France and Italy." More than half a dozen of the Gungthuria copper celts are exactly like Irish bronze celts. The silver objects found here are "about the thick-ness of ordinary paper, comprising two classes, namely, circular discs and *bulls' heads*." The latter resemble, as their name indicates, the figure of a bull. It has been suggested, on the one hand, that they were probably ornaments to decorate dedicated cattle, and on the other, that they were human ornaments, not bovine. From the fact that all the copper and silver pieces were found buried in a well-arranged series of layers, it has been surmised by Mr. Bloomfield that "this curious find had originally been buried for some special object, probably in connection with some religious rite." Lastly, it may be noted that the antiquity of the Gungthuria find has been doubted by some on account of the association of silver ornaments; but Mr. C. Brown sees "no reason to suppose that a race acquainted with the difficult metallurgical processes by which copper is extracted from its ores, should not be equally able to smelt silver too, perhaps from some of the highly argentiferous galenas which are known to occur at some localities. Again, the high antiquity of metallic silver pieces is proved by their having been met with in very early deposits in Spain and the Mediterranean region." (*Rais Catal.* p. 11).

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[1] See *Proc. Asiatic Soc. Bengal*, 1870, p. 131 (illustrated) and *Jour. Asiatic Soc. Bengal*, Vol. 48, p. 136 The chief authorities on these very interesting finds are Mr. Bloomfield, Dr. Oldham and T Cockburn, all of whom are quoted by Brown, pp. 146-151, who also gives a very detailed description of the whole lot.

Copper celts and arrow-heads have also been found at Bhagatoro, Karachi district, Sind; at Kohistan hill and tank, probably near Gwadar in Baluchistan; and at

Sholazan, Kurram, in N. W. Frontier Province. The second of these was accompanied by a silver bracelet.

Thus, we may conclude with Brown ; "These discoveries prove the range of copper implements all across Northern India almost from the Hooghly to the far side of the Indus, and from the foot of the Himalayas to the Cawnpore district."

THE CHRONOLOGY OF INDIAN COPPER AGE

With regard to the extremely interesting question as to what period we can exactly attribute the copper age in North India, it has been surmised by Mr. Coggin Brown that the downward limit for the introduction of iron was probably subsequent to the Rig-Veda about 1000 B.C. and that "copper must have been, in general use for some milleniums earlier." He points out that the discovery of copper implements at Telloh in Babylonia shows its prevalence in this region before 4400—3800 B.C ; that in Egypt it was the only metal[1] in use during the first three dynasties (Circa 4400-3800 B.C) ; and that, as it has been *assumed* that the knowledge of iron came to India from Babylon, there is also *some* reason to suppose that the art of smelting and casting copper *may* have come from that direction too. Mr. Brown seems to think, in other words, that the Indian copper age is subsequent to the 4th Millennium B.C. and earlier than 1000 B.C. which he, together with Vincent Smith, recognizes as the date for the advent of iron. He draws attention to the fact that the similar Irish finds have been attributed to 2000-1800 B.C., though he does not claim this as an argument in dating Indian specimens, and points out how the growth of the large variety of Indian implements argues in favour of a considerable period of copper time.

The arguments for the theory of the importation or introduction of copper from Babylon or Egypt to India are not conclusive. As is generally the case in the discussion of every question of Indian antiquity, Indian indebtedness to others is taken for granted. This theory however was previous to the discoveries made at Harappa and Mohenja Daro. These discoveries indicate that the Indus civilization, like the Sumerian, was based on the use of copper, showing that the copper age prevailed in India in the very age in which it prevailed in Egypt and Mesopotamia. Naturally the question of the relative indebtedness of Egypt, Babylon and Sindhu has to be considered in the light of the new discoveries. We know that copper finds of North India were the most extensive in the world. We know that there was a similarity of copper culture in the three areas of the Indian oceanic littoral. Naturally the conclusion suggests itself that the real discovery of the art of smelting copper might have been made in India, Egypt and Babylon being indebted to India in this respect. The question cannot be decided definitely as yet; but there are equally strong reasons to believe taat the copper age spread from India westwards as for the belief that it spread either from Egypt or Babylonia to India. In any case no dogmatic assertion like that indulged in by many western writers is hardly just or reasonable.

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[1] The Aegeans came to have it about. 4000 B.C. and, according to some, introduced it into Egypt. See *e.g.*, the *Encyclo. Brit.* (Article on the Aegeans).

It may be incidentally pointed out here that it was probably from the Aryans that South India came to know the use of copper. An examination of the words current in the different languages of South India seem to indicate this. The Sanskrit name for copper, *tamra*, is supposed to be derived from the root *tam* to faint, on account of the loss of colour which the metal undergoes when it is put in the fire. This derivation is somewhat doubtful, but it seems to be certain that from this Sanskrit have been obviously derived the *tambra* of Mahratti, *tamba* of Hindi, *tambaga* of Malay, *tambra* of Kanarese, *chembu* of Tulu, *chembu* of Malayalam, *tamba* of the Sinhalese and *sembu* of the Tamils. The Telugus call it red metal (*ragi*), wnich is a literal translation of *sembu*, as well as by the name *tambramu.* It can be indeed argued from the existence of an alternative term for the metal in Sanskrit in *tamraka*, it might have risen from a word connected with Tamil. In this case it may be argued that the knowledge of copper was derived by the Aryans from the south, the later Tamils themselves calling the metal *sembu* by corrupting the Sanskrit term which was originally Dravidian. But the possible objection to this theory is that copper was not indigenous to the south, that it was on the contrary abundant in North India to such an extent as to give rise to the Indus valley civilization and possibly the allied civilizations of Egypt and Babylon. It is probable however that the men of the Sindhu valley themselves got the metal from the further east or north which was then tenanted by the Dravidians. In this case the credit of the discovery of metals must be given to the pre-Aryan inhabitants of Hindustan, both the men of the Sindhu valley and the Aryans being indebted to them both for the metal and its terminolgy. The South Indian Dravidians in any case could not have been aware of this. If they had done it there would have been, as Bruce Foote says, copper finds side by side with stone ones among the Dravidian artifacts. In fact, the very reason why they were beaten in the progress of civilization of the Egyptians and others of the Mediterranean race to which they themselves belonged, is the discovery and use of copper and bronze by them. The civilization of Egypt and Babylon was the civilization of early metallic age. The acquaintance of Egypt and Western Asia with India after the 4th millennium B. C. might have been followed by the smelting of copper among the pre-Aryan Indians; but we have already seen, the *tamra* and *sembu* of the south seem to clearly indicate 'Aryan' introduction.

BIBLIOGRAPHY

All the authorities available are referred to in the footnotes.

CHAPTER VIII

THE INDUS VALLEY CIVILIZATION

It is advisable, at this stage, to describe the momentous and monumental remains of a long and synchronous period of culture, discovered of late at Harappa in the Montgomery district, Punjab, by Rai Bahadur Dayaram Sahini, and at Mohenjo-daro, 400 miles further down in the Larkhana district, Sindh, by Rakaldas Banerjee and K. N. Dikshit of the Indian Archæological Department,—remains of incalculable value in determining the place of India in the early history of human civilization.

The ruins at Harappa were for the first time observed by Burnes (see in his *Travels in Bokhara*) and Masson (see his *Journeys in Baluchistan*); but they were professionally examined for the first time by Cunningham in 1873. He saw that they were the most extensive of the old sites along the Ravi. Already railway contractors had committed havoc in the sites and Cunningham's excavations were in consequence, valuable as they were, less valuable than they would have been if they had been carried out earlier. Cunningham's finds included late relics like Kushan coins as well as earlier ones like long flint scrapers and specimens of archaic pottery. From Cunningham's illustrations we understand that the scrapers were very skilfully flaked and that the pots were bulbous in form and constricted in base. Cunningham's finds also included (1) three large ring-stones of yellow limestone, two feet in diameter and with undulating surfaces, (2) two small objects made of dark brown jasper and shaped like chess pawns and (3) a seal of unpolished black stone, on which was engraved a bull

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[1] For Cunningham's seals see his *Arch. Surv.* Vol. I, Plate 33. For other references see *Ind. Antq.* XV, p. 1 and *J.R.A.S.* 1912, p. 700. Codrington's *Ancient India* (1926), pp. 7-10 is suggestive but not always acceptable.

"which is humpless and therefore not of the Indian genus" together with a row of pictographic characters (illustrated in Codrington p. 8.)

The next discoveries in this region were made in 1904-5 in the village of Nal in Kelat State, Baluchistan (*Arch. Sur. Reports* 1904-5). These finds consisted chiefly of painted pottery. As Codrington says, " They are all wheel-thrown and made of a fine-textured clay of a light red colour. Bowls of various shapes appear, but nothing approaching the modern lota-shape. Straight-sided cups and jars are common. The bowl forms are provided with flat-rimmed bases. The patterns are outlined in brown, sometimes on a yellow ground picked out with red, the designs used being limited and obviously decadent. Zigzag bands are almost universal. Tree and branch forms and certain symmetrical mango-like designs are also common. On one bowl the Indian humped bull appears. Some of the unpainted pots are ornamented with waved bands in relief Codrington quotes the historian Myre to show that this type of pottery belonged to a widely-spread group, the members of which, although in no sense identical, were related. Examples of it have been found in Cappadocia, Anatolia, Syria, Northern Persia and the region of the Black Sea and South Mediterranean. The ornamentation in the Baluchistan pots moreover, he points out, connects them with those of Susa though in 'a decadent form'; as some of the back-spouted, red, unpainted and kiln-fired pottery of Chitral connect them with Anatolian jugs. Prof. Sayce, in tracing the history of pottery at Susa, says that the earliest period of it was followed by an age which shows signs of less skilful invaders—just before the Babylonic supremacy of Sargon. Does the 'decadent' Baluchistan style, to which Codrington refers, indicate a clue to an invasion or settlement of Susa by the Nal people in this age ? We cannot answer in the present stage of research; but there is no doubt that the Nal finds indicate a connection between the two cultures.

The valuable clues afforded by these archæological finds directed the indefatigable energies of Sir John Marshall and his department on further investigations. An expedition was despatched under Mr. H. Hargreaves to Baluchisten to discover more remains of the age. Experimental aeroplane surveys were carried out along some 50 miles of the old bed of the Ravi on which Harappa stands; and new, unknown sites were brought to light some of which were evidently contemporary with Harappa and others of a date transitional from it to later history. "Taking this survey on the Ravi as a rough criterion of what may be expected along other river beds," wrote Sir John Marshall, in the *Times* of Feb. 26, 1926, "and remembering that some 3000 or 4000 miles of these beds have still to be examined, it may be imagined how almost limitless is the field awaiting the excavator."

The remains[1] brought to light in these places by R.D. Banerji (the original discoverer), Vats, Dikshit, Sahni and other officers of the Archæological Department shew that they belonged to the copper age, a transitional period when metal was rare and flint was still used for implements. They indicate the existence of finely-built cities, of a very highly advanced culture, very closely similar to that of Mesopotamia. Mohenjo-daro, for example, which is much smaller than Harappa, has revealed, beneath its mounds, "the remains of a finely-built city of the chalcolithic period (3rd millennium B. C.) and beneath this city, layer after layer of earlier structures, erected successively on the ruins of their predecessors." The buildings include houses and temples. These are massively built of burnt brick, and provided with well-constructed pavements and water conduits in burnt brick covered by marble slabs. Side by side with burnt bricks often set in mortar, there were in use, particularly for terraces and courtyards, sun-dried bricks. "The temples", says Sir John, "are distinguished by the relative smallness of their chambers and the exceptional thickness of their walls—a feature which suggests that they were several storeys in height. To a temple also doubtless belongs the spacious court-yard, with chapels or other apartments on its four sides." Dwelling houses, are "bare of all ornament, but are remarkable for the excellence of their construction and for the relatively high degree of comfort evidenced by the presence of wells, bathrooms, brick-flooring and an elaborate system of drainage, all of which go to indicate a social condition of the people surprisingly advanced for the age in which they were living."[1] Unlike Egypt and Crete the Indus valley was a paradise of the middle classes. Even Mesopotamia was only second to it in this respect.

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[1] The matter contained here is taken from the striking articles of Sir John Marshall in the *Illustrated London News*, Sept. 20 and 27, 1924 and the *Times* of Feb. 26. 1926, all re-produced in the *Hindu* about a fortnight later in each case. In Sept. 1927 Prof. Sayce pointed out the strong resemblance between these finds and those found by De Morgan at Susa. Mr. S. Smith and Mr. C. J. Cadd have shown similar objects in Mesopotamia (*Illus. Lond. News* 14th October). See also *J.R.A.S.* for October 1925 p. 697 ff. and *A. S. I.* 1921-2 and 1923-4. pp. 47-54.

The people were still in the transition between the stone and metallic ages, the 'sub-neolithic age' as S.K. Chatterjee calls it (*Ind. Hist. Qly*, I.p. 177.) Stone knives and scrapers, as well as the cores from which they have been chipped, have been found together with things made in copper, gold, silver, lead and probably of mercury also. They were "manufacturing jewellery and other articles in highly polished gold, fine paste and glazed blue and white faience." The pottery is varied in type. It included not only the rough hand-shaped pots but those made by the wheel. It was either plain or painted like that at Baluchistan but more 'decadent.' The first contains ornamentations of narrow, plain and zigzag bands, spirals and lotus designs. Further the prevailing shape is close-necked, approaching the *lota* in shape. Codrington suggests that these indicate the imitation but Indianization of the Susa type. Some unpainted types of Harappa have novel and well-finished shapes. A stone-jar is associated by Codrington with iron age burial pottery, as the painted type is connected with the Susa type. Among the minor articles, incised plates of conch shells, terracottas; toys; bangles of blue glass paste and shell; new types of coins or tokens; knives and cores of chert; curious stone rings; dice; and most important of all—a number of engraved and inscribed seals bearing inscriptions in a hitherto unknown pictographic script. The seals found in almost every building excavated are, says Sir John, "in a style worthy of the best Mycenean art." One striking seal depicts a fine 'Brahmani' bull, indicating incidentally that the breed of such bulls was "as good 5000 years ago as it is to-day." Another seal portrays the sacred *pipal* tree "with twin heads of antelope springing from its stem; and on others are tigers, elephants, rhinoceroses and a variety of other animals, but not, be it noted, the horse which was probably imported into India at a later date by the Aryans....A noteworthy find made beneath the floor of one of the houses was a group of copper vessels, and implements, and in one of the larger vessels, a collection of jewellery of polished gold, silver, carnelian and other stones, including a particular handsome necklace or girdle of carnelian and copper gilt, talismanic stones in polished gold settings, 'netting' needles of the same metal and bangles of silver." The bead ornaments resemble the Mesopotamian ones in material and technique.

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[1] The Harappa houses are similar to those at Mohenjo-daro; but Sir John refers to a unique and large edifice with solid brick walls parallel to each other and forming broad aisles of 14 feet. More than 10 of these have been exhumed. Each wall is 52 feet long. The thickness varies. The object of this remarkable corridor-provided edifice is not known. See the *Hindu* of Jan. 4, 1928 for Sir John's excellent account.

The Sindhu men had a comparatively advanced type of religious faith. Their temples indicate it. But we have no means to say whether there were icons or not. "The only objects found in association with them and intended apparently for cult worship are of two kinds—namely, 'ring-stones' and 'chessmen.' The former have been compared with the 'mace-heads' of Sumer, but their undulating shape and the ponderous size of many of them (they require four or five men to lift) make it very doubtful if they were intended to represent mace-heads. The latter are of faience sometimes of stone or other substances, though small in size by comparison with some of the ring stones; their shape recalls to mind the mediæval 'chessman' pillars of Assam, with which it is not outside the range of possibility that a connexion may be established. The fact, however, that no anthropomorphic images have yet been unearthed in these temples must not be interpreted as proof that the worship of such images was unknown. On a tablet of blue faience which has just come to light is depicted a figure seated cross-legged (like Buddha on a throne) with a kneeling worshipper to right and left, and behind the worshipper a snake (*Naga*) while at the back is a legend in the pictographic script of the period. Now it is possible that this seated figure is nothing more than a royal personage, but the presence of the kneeling devotees, and particularly of the *Nagas*, certainly suggests that the central figure was intended to represent a deity rather than a king." Codrington refers to the clay figures of a goddess who wears a high head-dress and clay animal figurines.

The funeral customs of the Sindhu people are, to a certain extent, revealed by the remains. From the fact that a grave for contracted burial was found built into a wall at Mohenjo-daro, Codrington infers that this was the earliest method of burial and that later on the body was burnt, and the urn-burial appeared. "The usual method of disposing of the dead in the latest cities of Mohenjo-daro and Harappa," says Sir John Marshall on the other hand, "was by cremation, a few fragments of the burnt bones being subsequently collected and placed in a large earthenware jar along with a number of medium-sized and miniature vessels or in small brick structures resembling Hindu *samadhis*. At Mohenjadaro, it is true, some complete skeletons in excellent preservation are now being unearthed, but these appear to have been interred at a much later age, probably about the beginning of the Christian Era. At a spot called Nal, however, some 250 miles south of Quetta, in the Jhalawan country of Baluchistan, Mr. Hargreaves has discovered a burial ground of the same Chalcolithic period, where the dead were buried either in graves of sun-dried brick or directly in the ground. In the former case, the skeleton was complete; in the latter only a few bones and the skull of each body were found, instead of the whole skeleton, and they were accompanied by numerous earthenware vases, copper implements, beads, grinding-stones and other small objects. These objects are generally analogous to those found at Mohenjo-daro and Harappa, though perhaps somewhat later in date. The painted potteries from this burial ground constitute an exceptionally fine series, most of them being superior in fabric and design to those from the city sites."

THE HARAPPA AND MOHENJO-DARO SCRIPT

That the Sindhu men were acquainted with some kind of writing, is clearly proved by the discovery of certain inscriptions in the seals found at Harappa and Mohenjo-daro. But the problem of deciphering these is at present insuperable. " It is manifest from the formation of the characters themselves ", says Sir John Marshall, " that originally the writing was a pictographic one, one of the commonest characters, for example, on our Indian seals bearing still the obvious likeness of a fish. In the Sumerian usage of Mesopotamia each one of these characters is said originally to have represented a single word without phonetic element, but pronounced as a monosyllable, the characters being thus analogous to a numerous class of Chinese ideographs in use to-day in the Far East. At a later period the characters appear to have been used by the Semitic peoples in those regions not only in their pictographic but also in their phonetic value, thus giving us an interesting parallel to the condition of affairs still obtaining in Japan to-day, where the Chinese characters are sometimes given both the meaning and the (approximate) sound of the original Chinese, sometimes only the meaning of the original with the pronunciation of the corresponding Japanese word, while sometimes only the Chinese pronunciations of character, divorced from its meaning, is used phonetically as a sort of syllabry wherewith to write the poly-syllable words of the local language. That this multifarious application of the characters composing the script leads to complications rendering its decipherment extraordinarily puzzling at times, is obvious; and it will be no easy problem to determine which method of reading the characters is to be followed in the case of our Indian records from Harappa and Mohenjo-daro, as we have at present no means of determining whether the script was used in India in its pictographic or its phonetic value or in a combination of the two. In India the materials are at present too scanty to permit of even this initial problem being dealt with, and it is essential that they should be augmented as extensively as possible, if we are to make progress in the direction of their interpretation."

THE HELIOLITHIC CULTURE

The civilization to which Egypt, Babylon and the Sindhu belonged can, in fact, be brought under that Heliolithic stage of culture which Prof. Elliot Smith regards as distinctly Egyptian. Prof. Smith attributed to the Egyptian or Phenician mariners the introduction of the elements of the Heliolithic culture over a large portion of the world. Customs like mummification, the construction of megalithic monuments, the making of icons, the beliefs in animism, the idea of petrifaction of men and women by spirits living in stones, the story of the deluge, the belief in the origin of kings from the sun or the sky, the story of the origin of the chosen people from incestuous unions, the belief in the heavenly twins, the worship of the sun, the use of the *svastika*, the adoption of the phallic emblem and cult, the prevalence of the serpent cult in its different aspects; the practices of circumcision, tattooing and massage, the expansion of the ear-lobes, the artificial deformation of the skull and teeth, the perforation of the lips and nose, the practice of linen-weaving, the use of pearls, precious stones, metals and conch-shell trumpets; the modes of mining metals, intensive agriculture with terrace irrigation, boat-building, marine aptitude and skill, the use of the boomerang and similar features throughout the region from Egypt[1] to America, are attributed by him to Egyptian influences.

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[1] Prof. W. Perry and Elliot Smith trace the advent of the megalithic monument builders of Britain to the search for gold, copper, lead, etc. The magalithic civilization of W. Europe was "derived from a metal-using civilization in the ancient East. Oceania is believed by this school to have had no people more than 2000 years back, which seems to be too late a date.

It is difficult to say how far we can accept this Egyptian hypothesis. Even before the discoveries of the Indus valley Mr. Richards I. C. S. pointed out " that some of this evidence has had a very indistinct bearing on South India. The cult of the ' heavenly twins ', for instance, is conspicuous by its absence though it appears in the Asvins of the Rig Veda, and is perhaps suggested by the Dyads or dual deities of the Vedic hymns. The South Indian evidence for the preservation of the dead by mummification is defective, though funeral rites yield a host of analogies with the West. The evidence for *couvade* in India is confined to a very few communities, and it cannot therefore be described as characteristic. Circumcision among Hindus is confined to a section of the Kallar and is also recorded of the Bedars of Mysore, both military castes. It is an open question whether the practice should not be ascribed to Muhammadan infuence, in the case of the Kallars to the Madura Sultanate which followed Malik Kafur's invasion in the 14th century, and in the case of the Bedars, to Haidar Ali. As for the boomerang, the use of which is confined to the Kallars and Maravas of the south and the Kolis of Gujerat, evidence is wanting to show that the weapons used in India and those used in Egypt, Australia and Arizona are of common origin." Mr. Richards goes on to observe that the "analogies between the Egyptian pylo and the Dravidian gopuram or between the Babylonian *ziggurat* and the Dravidian *vimanam* are open to objection. In the first place there is a most disconcerting chronological lacuna between the date of the earliest Dravidian gopuram or *vimanam* an the alleged proto-type ; in the second place the evolution of gopuram and vimanam has been very satisfactorily accounted for by Fergusson and others on indigenous lines. On the other hand it must be admitted that the rigorous exclusion of the arch from the religious architecture of Egypt, Greece and India is most suggestive.

" Again some of the customs cited by Prof. Elliot Smith are of such universal distribution among both Negroid and Mongolian peoples, to say nothing of the intermediate races ", that they seem to prove little more than that mankind was originally of one blood, a conclusion of no interest for our present purpose. Leaving these minor points out of consideration, we find, in association with megalithic monuments, throughout the world, 'a culture-complex' which are (1) Sun worship, (2) Serpent worship, (3) Phallic worship, (4) the worship of the sacred stones, both carved and plain, and (5) terraced cultivation, together with such practices as tattooing, ear-piercing, the use of *svastika*, and of shell-trumpets, a superstitious regard for the sanctity of the human head, an aptitude for navigation and a mass of rites and beliefs too numerous to detail." Mr. Richards in conclusion points out that "this megalithic or Heliolithic culture seems to preserve remarkably consistent uniformity, and it seems to underlie the ancient culture of Egypt, Mesopotamia, Sabaean Arabia, Crete, Asia Minor, Persia, Greece and Rome, and if the evidence adduced by Prof. Elliot Smith be accepted, it has girdled the world."

The discoveries of the Punjab, Indus valley and Baluchistan go to demonstrate these remarkable conclusions. They distinctly prove that Prof. Elliot Smith's[1] conclusions were one-sided, that the Heliolithic culture was not the work of a single race of people, that it was apparently the joint achievement of a wide world in which the Sindh men were no by means the least obscure. If any conclusions at all are possible from these finds about the origin of the Heliolithic culture these can hardly be opposed, in the present state of our knowledge, to the supposition that India had as great a share in it as Egypt or any other region. The relative antiquity of these civilizations is yet to be proved. Sir John Marshall believes that the Sindh civilization may be only a part of a widespread Indian or rather Gangetic one and the future alone can show how far the assertions in favour of the earlier age of the Egyptian and Babylonian cultures can stand the test of truth and evidences.

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[1] It is interesting to note the obduracy of this eminent savant even after the Indus discoveries. Writing in the *Times* recently, he referred to the fact that the extinction of the dual system of government in Bhutan on account of the death of the Maharaja of Bhutan a few days before it meant the extinction of a system of government which was Egyptian in origin and which extended to such wide areas as Japan, Borneo and Bhutan. And in the course of the discussion he *took for granted* that Sir John Marshall's disoveries have conclusively proved the influence of Sumer and Elam in Western India. The conclusive proof is only imaginary ; for at the very moment when Prof. Smith was writing Sir John was writing that there was a very great probability of the cultures in the West having been originated in the East. In any case there is absolutely no basis for dogmatically holding that Egypt was the source of the institutions generally associated with the Heliolithic culture. In the light of all recent discoveries to maintain such an unsound hypothesis seems to be more constancy than regard for evidences. Incidentally it may be noted that it is not necessary to go to Egypt for a system of government where the king is a non-entity and the minister or member of any other family is all-powerful. It is sufficiently explained by human nature and historical necessity. To import the Egyptian idea of the spiritual headship of the descendant of the sun and the temporal headship of a non-royalist into every similar institution in the world irrespective of age and country seems to be Egyptomania of the worst type.

WHICH WAS THE EARLIEST OF THE CIVILIZATIONS?

Naturally the Sindh discoveries have introduced an era of rich speculation as to the relations between the Assyrian and Sindh cultures. A study of the extensive literature which has risen in connection with the subject enables us to divide the scholars who have taken part in the discussion of the question into two great camps, namely those who hold that the Sumerians were the lenders and those who hold that all the glory of the Babylonian civilization must be traced to India. Of the latter Sir John Marshall may be taken as the best authority though he acknowledges that he cannot be positive or dogmatic about the matter as the scholars of the opposite camp have been. There is, he points out, a concensus opinion among scholars that the Sumerians were an intrusive element in the Mesopotamian population, and various attempts have been made to attribute one region or another outside Mesopotamia as their original country. "The discoveries of the Sumerian type throughout the Indus valley with extensive city sites spread over areas widely separated from the sea and consisting of many layers lower down, suggest the possibility of India proving ultimately to be the cradle of the Sumerian and later civilizations of Western Asia."

One argument in favour of the Indian origin of the Sumerian culture is the availability of many of the materials found in Mesopotamia only in India and not elsewhere. One of these materials is cotton. It has been long known that the Babylonians and the Greeks used cotton which they named *Sindham* or *Sindhu* apparently from the Sindhu valley. There has been a doubt however as to whether the cotton used in the West was the one produced from the cotton trees like the silk cotton or the variety produced from the plant technically called *gossypium.* The discovery of a silver vase filled with jewellery and covered by a woven cloth in Sindh has set the doubt at rest. The fragments of cloth indicate that they were made of the true cotton; for according to Turner, the Director of the Technological Research Laboratory, Indian Central Cotton Committee, Bombay, they indicate the typical convoluted structure of the true fibre. The discovery proves that the ancient peoples of the West received the material as well as the art of weaving cotton from India. It also shows that the art of weaving was earlier than the use of iron. The textile art was an Indian invention. Most probably the Sindhu textile industry was a logical development of the neolithic industry. It is difficult to say whether the art actually began in this part of the country or other parts of neolithic India. However it might have been, the presence of cotton work in Sindh indicates a link between the neolithian and chalcolithic cultures.

Another fact indicative of Indian origin is that the materials of the Mesopotamian beads are Indian. Mr. Earnest Mackay discussing the question of the origin of these (See *J. R. A. S.* 1926, pp. 696-701) says: "The fact that decorated carnelian beads are found in quantity and at all periods in India and but scarcely over a limited period at Kish in Mesopotamia must prove, I think that India was either the country of origin or that a third country which had early trade relations with India and more difficult ones with Babylonia, manufactured these beads. Personally in view of the long period of time during which these beads were buried with the dead in that country, I am inclined to think that India was the original home of their manufacture." With regard to lapiz lazuli (*Vaidurya*) beads Mr. Mackay notes that the Kish beads are not so finished in cut, shape and polish as the carnelian ones, though the latter is a tougher material. He sees in this an indication of its exotic character. He believes that lapiz lazuli might have been imported into Mesopotamia from Persia, and he surmises that the Mount Bilki which according to an Assyrian record was a mountain noted for lapiz lazuli might be identified with Mr. Demavond, near Kashan (which was noted for it in the ancient period). But as against this there are two facts. First there is no trace of a mine in that part of Persia as Mackay himself acknowledges. Secondly *Bilki* seems to me to be the same as the word *beryl.* If so, the country of beryl in South India, Salem district, might be the original producer of the material from which it was exported both to Sindhu and Mesopotamia. Further the Western Ghats are known in Sanskrit as *vaidurya-land*—a fact which seems to me to corroborate the Indian origin of the Mesopotamian beads of this stone.

Still another point of resemblance is pottery. Codrington believes that India was the borrower in this respect. He believes that the pottery found in Sindh and Baluchistan suggests a combination of proto-Elamite Sumerain cultural elements as well as those of the iron age graves of South India. He seems to suggest in other words that the Sindh pottery was midway in age between the Mesopotamian and the Adichchanallur ones. But this is also capable of another explanation. The lack of advanced art which Codrington sees may after all be due to a larger antiquity. Further, there is also the opinion that the painted pottery of India is much daintier in colour and execution, just as the animals in the seals surpass anything found elsewhere, and India might have been the giver.

THE ETHNOLOGY OF THE SINDHIANS

Now arises the important question as to the ethnology of the people who were the authors of this remarkable civilization. It has been suggested by some that they were Dravidians. In 1917 Dr. Hall,[1] for example, suggested that they were "the pre-Ayran (probably Dravidian) people of India known in the Vedas as the Dasyus or Asuras, whose culture was largely destroyed in the second or third millennium B. C. by the invading Aryans from the north, just as the older Aegian culture of the Mediterranean (which in some respects bears a a striking resemblance to this culture of the Indus) was largely overwhelmed by the invading Achaeans." But this surmise of the eminent archæologist is disputed by others. Mr. B. Guha, for example, points out that the statuettes of "the bearded men exhumed at Mohenjo-daro portray a distinctive brachycephalic type, while the Dravidians have been, like the Aryans, distinctly dolico-cephalic. Further the Sindh figures, he notes, reveal a very low forehead, fleshy lips and narrow oblique eyes which are the characteristics, neither of the Mediterranean race nor of the Alpine race of brachycephals. To affiliate the people of the Sindhu with the Mediterranean race to whom the Dravidians belonged or to the Alpine race seems to him in the light of these finds, to be impossible. But to come to this conclusion in a hasty manner is not justifiable. In the first place it has been suggested that the Sumerian founders of the Mesopotamian culture before 3,000 B. C. might have been a branch of the primitive Dravidians from the Indus valley. Mr. Banerji (see *Mod. Review*, 1924, p. 673) and Sir John Marshall also favour this Dravidian connection. The former sees in the Dravidian Brahuis and the ancient pottery of Baluchistan which was closely connected with that of the Indus evidences of the march of culture from the west. The rituals, religious motives, burial customs, ornaments, the use of double-spouted libation vessels, the cult of a snake deity as shown by images of snakes, the double-axe symbol (discovered in Mohenjadaro coin), the fine egg-shell pottery and polychrome painting in the pottery incline him to connect the Indian culture with Cretan and Ægian culture through Mesopotamia about 3,000 B. C. The Indian symbols, he further believes, are to be found in old Cretan writing. These symbols are in three forms hieroglyphic, syllabic and alphabetic at the latest. The last is linear as in Crete and not pictogrammatic.

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[1] In his *Ancient History of the near East* (1913) Hall had already suggested a primitive Dravidian origin to the Sumerians.

The boats and nautical appliances of South India and proto-Dravidians again were similar to those of the Mediterranean sea, that is Egypt, Levant and Mesopotamia. James Hornell (*J.A.S.B.*, *Memoirs* VII, No. 13, 1920) therefore concluded that the proto-Dravidians were a Mediterranean people who brought into India the boat types of their original home in Egypt and Levant, migrated to the east, settled for some time in Mesopotamia where they borrowed or invented the circular coracle and the reed boat and then, owing to either the pressure of the *Semites* from Arabia or the Alpine or Mongoloid Akkads from the north, had to leave Mesopotamia and ultimately come to India, the Brahui language marking their presence in Baluchistan at one time. In India they spread along the Ganges and the Indus valleys, introducing the irrigation system and then came to South India then occupied by the Negritos and proto-Polynesian stock, and absorbed them politically and linguistically. The result of this fusion, concludes Hornell, was the Dravidians of South India.

Dr. Kennedy believes that the Dravidians were probably connected ethnologically with the "Black Ethiopians of Mekran" and the "Black-heads" of Babylonia; and that it was they that introduced the Brahmani bull into Babylonia by the Mekran route in the 7th century B.C. The intercourse between the Dravidian world and the seats of civilization in the west, continues Kennedy, was a reality. "The sea between the west cost of India and the Persian Gulf is navigable by native craft for six months of the year; and some small coasting trade existed from an early age. The proto-Phenecians of the Persian Gulf and the Semites of South Arabia were seafaring peoples from the earliest times; and they may have taught the Dravidians the art of navigation. The oldest trace of their activity is the invention of an Indian alphabet, an alphabet employed at first for mercantile uses. Other traces of commerce between the Dravidian coast and the Persian Gulf are rare and late." Dr. S. K. Chatterjee (*Mod. Review*, Decr. 1924). would trace even words *Dravidian* and *Tamil* to the Cretan. *Termilai* and sees resemblance between Lycian and Tamil words.

The conclusions in favour of or against the identity of the Sindhu men with the Dravidians is still in a doubtful stage. The presence of both brachy-cephalic and dolico-cephalic features seems to indicate the fusion of several races. the brachy-cephaly itself being both Alpine and Mongolian. It is quite possible that there was in pre-Aryan India a culture complex in which 'Indo-Sumerian,' 'Dravidian', pre-Dravidian and even Mongoloid cultures had an equally important part. The discovery of finds similar to those of the Indus valley in N. Baluchistan, the N. W. Frontier Province, the neighbouring wild lands which are inaccessible to-day and in China proves that the Heliolithic culture was universal and that all the peoples from the Mediterranean to the China sea had a hand in its development. It seems to have been neither Cretan nor Mycenean nor Egyptian nor Mesopotamian nor Sindhu exclusively. It was wide-spread. Indeed it has been suggested that the future might show that the Gangetic valley too had the same culture.

THE ARYAN ADVENT

However it might have been, it was in the midst of a complicated culture-complex that the Aryans, that wonderful race which has been rightly regarded as the most advanced type of the human race and which has become the leader of civilization in all parts of the world emerges first in history. And here the question arises as to where from this race came from, what was their relation to the 'Sindhu', Indo-Mediterranean and pre-Indo-Mediterranean races who existed in India. The question has been one of the most fruitful themes of controversy in all historical literature, and the controversy has not died even to-day. And we shall proceed to discuss it in the next chapter.

BIBLIOGRAPHY

The references to the Indus civilization are fully given in the above pages. To them may be added: Ramaprasad Chanda's "Survival of the Pre-historic Civilization of the Indus valley" forming No 41 of the Memoirs of the Archæological Survey of India. The works of Evans, Sayce, Mackay and others are absolutely necessary for comparative study. A three-volume morograph on Sindh discoveries by Sir John Marshall is the press.

CHAPTER IX

THE ARYANS

The early mythologists and philologists of the 19th century deduced the Aryan-speaking peoples of Europe and India from a single 'Indo-European race' which once occupied a single area and from which it migrated to all those parts of the world were it is found to-day. It has been doubted by *later* scholars whether there was, at any time in history a single homogeneous race called Aryan; and the suggestion has been made that there must have been only a linguistic, no ethical unity. But it is conceded even by those who do not grant the theory of racial oneness that the prevalence of certain common words among the various races of Europe and Asia points to the occupation, once upon a time, of a single tract of country by them and the consequent acquaintance with a common tongue. Whether this tongue, the source their common of vocabulary, was their own or whether it was the tongue of some previous race, is a question of controversy. For practical purposes it is sufficient to state that philology claims to have proved a common habitation if not race, and it was from this tract that they migrated to the different parts of Europe and Asia where they are found now.

EARLY THEORIES ABOUT THE ARYAN HOME

A regular fury of controversy has raged round this original Aryan home. The earliest theory (in which Mommsen believed), was in favour of the Mesopotamia valley. About 1800 Adulung the father of comparative philology placed it in Kashmir. It was he that first laid down that the European Aryans came from the East in different waves like those of the Iberians, Celts etc. Then the archaic character of the Avesta and its close relation to Sanskrit was discovered and the Kashmir hypothesis was given up in favour of a region further north where the Indians and Iranians must have lived together. In 1820 Rhode suggested Bactria as this region. Till 1880 this theory held the field. Many curious arguments, sound and unsound, were given in support of it. The path of culture was necessarily that of the sun (as Pott said). Klaproth and Kitter identified certain European tribes with the Chinese tribes. Lassen (1847), Grimm (1848) and Max Muller (1859) believed in an irresistible impulse, 'whose precise cause is hidden in obscurity' as the cause of this migration from Central Asia. Pictet (1859) constructed an elaborate theory of the successive migrations. He brought the Hellenes and Italians by a route south of the Caspian through Asia Minor to Greece and Italy. He brought the Celts to West Europe along a route south of the Caspian, through the Caucasus and north of the Black Sea and along the Danube. He traced the Slavs and Teutons along a route north of the Caspian through Russia. "His arguments, based on philological considerations and the knowledge of the plants and animals with which he supposed the nations were acquainted, are not now accepted. In 1861 Max Muller endorsed this theory. He spoke of "the primitive Aryan race, the primitive Aryan family, who lived as the first ancestors of the Indians, the Persians, the Greeks, the Romans, the Slavs, the Celts and the Germans within the same enclosures, nay, under the same roof," in the high plateau of Central Asia, the space between the Urals and the Caucasus which joins the steppes of East Europe with those of West Asia, the region around the Caspian Sea, in those days a very fertile and well-watered country. Max Muller gives four reasons for this conclusion. First, he points out, there are two linguistic streams one flowing north-west to Europe and the other south-east to Asia, which intersect each other in Central Asia. Secondly the earliest centres of civilized life have been in Asia. Thirdly later ethnological history provides an analogy It is from Central Asia that the large ethnic waves of later history have swept Europe and Asia. Fourthly "if the migration had taken place from Europe to Asia, particularly from Scandinavia, we should naturally look in the common Aryan language for a number of words connected with maritime life." But this is not the case. While there are common names for animals and birds there is no general name for the fish or even for the sea. Prof. Sayce corroborated the Central Asian theory with the arguments that Sanskrit and Zend are the earliest of the Aryan dialects and show the least changes, while Celtic shows the largest variations, proving thereby the nearness of the former to the primitive Aryan abode; that the Avesta tradition locates the creation of mankind in Central Asia; that comparative philology teaches us that the only two trees whose names agree in the East and West are the *birch* and the *pine*, and these indicate, for climatic reasons, the vicinity of the Aral Sea, to which, in his opinion, the Aryan myth of the wanderings of Odysseus probably refers.

The advocates of the Central Asian theory give detailed descriptions of the Aryan conditions in their original home, their route of migration to India and their part in orginating the Iranian and Vedic cultures. They say that while the earlier branches of the Aryans migrated towards the West and gave rise to the Aryan races of Europe, a later section migrated towards the Duab of the Oxus or ' Bactria.' It is believed that this is the *Aryana-Vraja* referred to in the sacred literature[1] of the ancient Iranians as the first and special creation of God. It was here that the common ancestors of the Iranians and Indian Aryans sojourned for centuries and developed a language which was the immediate ancestor of the Persian Avesta and the Indian

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[1] The most valuable contribution in recent times on the Central Asian theory is Nundo Lal Dey's *Rasatala* in the *Indian Historical Quarterly*, Vol. Iff. reprinted in book form. Amidst a maze of details he argues that Arya-Vija is Azerbaijan; Media = Madra; Chaldea = Salmali; Rasa = Ranga of Avesta or Jaxartes; Tala = Hun; Atala = Babylon; Alamba = Albania; Erythrean sea = Gridhrasamudra; Kadru = Kurd, Kasyapa = Caspian; Armenia = Ramaniyaka-dipa Similar identities regarding Danavas, Asuras, Daityas, Nagas, etc. are given by the author to show that the Aryans lived originally with all these in the heart of Asia and were in touch with surrounding countries.

Sanskrit. It was from here that the Aryans left towards the south, the plateau of Iran. Here, it has been suggested, they were split up into two big factions, the Deva-worshippers and the Asura-worshippers, as a result of which they had to part. The Asura-worshippers had to leave Iran and pass into India through the valleys of the Kabul, Kurrum and the Kumar. They became, it is believed, the Vedic people of India, the authors of all later Indian civilization.

The invasion into India, it is believed, lasted for centuries. For hundreds of years the immigrants lived in Afghanistan and in the region west of the Indus, and it took hundreds of years perhaps to reduce the 'aboriginal' peoples of the Punjab and colonise the country. It was in the course of these movements on both sides of the Indus that, it is believed, they perfected the Aryan tongue, the archaic Sanskrit, and composed the great *sacrificial mantras* afterwards put together in the celebrated *Rigveda*. During the same period, or perhaps a little later, the Iranian Aryans developed the Avestan language which was naturally akin to Vedic Sanskrit and composed the hymns which were afterwards put together by Zoroaster. This great religious leader has been variously attributed from 6000 B.C. to 500 B.C. Prof. Ragozin places him 'somewhere beyond 1000 B.C.' It is unnecessary to go into details about Zoroaster's date. It is enough to state that, according to the most plausible view, he was contemporaneous with the latest parts of the Vedic age.

THE THEORY OF EUROPEAN ORIGIN

From 1880 onward the Central Asian theory has been questioned, in favour of a European origin, though as to the exact site in Europe there has been considerable difference of opinion. Latham (1874) questioned the philological basis of the old theory. " He maintained, on the other hand, that a European origin was far more probable. His argument was two-fold. He urged firstly that Lithuanian is closely related to Sanskrit and no less archaic. Sanskrit must either have reached India from Europe or else Celtic, German, Lithuanian, Slavonic, Greek and Latin must have reached Europe from Asia. He says he finds no argument whatever in favour of the latter hypothesis, but merely a tacit assumption that the human species, and the greater part of our civilization, originated in the East. We find the main body of the Aryans in Europe, and a small detached body in Asia. Which, he argued, is *a priori* more probable? That the smaller body broke away from the larger, or the larger from the smaller? The species comes from the genus, and not the genus from the species. To derive the Aryans of Europe from those of Asia would be as reasonable as to bring the Germans from England, instead of bringing the English from Germany . . . We find, he argues, two bodies of Aryans, one nearly homogeneous and of small geographical extent, the other spread over a vast region and existing in numerous varieties. It is more reasonable to suppose, that the small homogeneous body branched off from the larger than to assume that the larger parted from the smaller." "Further, the philological researches of other scholars have shown that, in Europe, there is a chain of six Aryan languages beginning from Slav and ending with Greek, related to each other thus; Slav to Lett, Lett to German, German to Celt, Celt to Latin, and Latin to Greek. Closely related to Greek, on the one hand, and to Slav, on the other, is Indo-Iranian or Sanskrit. This missing link is due to its migration from its natural home southwards towards the Indo-Iranean plateau. The Indo-Iranean Aryans thus who are alone in the midst of other races and who are in a nomadic stage when we first become acquainted with them in history, parted off from the other six branches. Now what is the region from which this circular chain of Aryan languages in Europe could have been formed, and from which the Indo-Aryans could have migrated? The answer was given by Benfey in 1868. He laid down that it must have been north of the Black Sea, in the extensive European steppes. "He contended that certain animals, such as the bear and the wolf, and certain trees, such as the beech and the birch, with which the primitive Aryans must have been acquainted, are all indigenous to the temperate zone, and, above all to Europe, whereas the characteristic animals and trees of Southern Asia, such as the lion, the tiger and the palm, were known only to the Indians and Iranians. He urged that the absence from the primitive Aryan vocabulary of common names for the two great Asiatic beasts of prey, the lion and the tiger, or the chief Asiatic beast of transport, the camel, is difficult to explain on the theory of the migration of the Aryans from the region east-ward of the Caspian. That the Greeks called the lion by its Semitic name, and the Indians by a name which cannot be referred to any Aryan root, argues that the lion was unknown in the common home of Greeks and Indians."

Gieger, on the contrary, decided in favour of Central and Western Germany on the ground that the tree names of the primitive Aryans—the fir, the willow, the ash, the alder and the hazel, the birch, the beech and the oak—best suit that region; that the undivided Aryans must have lived in a cold northern region as the name of the birch is common to all Aryan languages; and that the Aryan cereals, rye and barley, could have been cultivated only in lands north of the Alps. Gieger also pointed out that the early Aryans were acquainted with woad and its use, that they were familiar with snow and ice and that they had common words for winter and spring, but not for summer and autumn.

Cuno gave arguments to prove that the Aryans must have been originally in the great plain of N. Europe which stretches from the Ural mountains, across Russia, North Germany and North France, to the Atlantic. He maintained that the primeval Aryans could not have been a small people but a numerous, nomadic pastoral race; that they must have occupied a region for thousands of years where they must have developed a system of grammar and speech; that they must have separated from this region owing to geographical circumstances, and then developed the dialectical varieties of which the modern Aryan languages are composed; and the best geographical conditions of such a region are afforded by the northern European plain. He further surmises that the Indo-Iranians must have first wandered with their herds further to the east to subdue and incorporate non-Aryan tribes; that the Italic and Hellenic races must have then extended themselves across the mountain chain of Central Europe; and that the Celts, Teutons, Lithuanians and Slavonians were branches of the original peoples. Even a more valuable contribution of Cuno was the theory that race need not be co-extensive with language; that the extension of the Aryan tongues was the result of conquest and assimilation.

J. Schmidt developed the wave theory of Aryan linguistic expansion. He showed that, at a remote age, the Aryan speech was unbroken; that local disturbances and dialectic variations then came into existence; and that they then spread like waves in every direction. "Schmidt also showed that the more geographically remote were any two of the Aryan languages, the fewer were the peculiarities they possessed in common. Thus while there are 59 words and roots peculiar to Slavo-Lithuanian and Teutonic, and 61 to Slavo-Lithuanian and Indo-Iranian only 13 are peculiar to Indo-Iranian and Teutonic. Hence Slavonic forms the transition between Teutonic and Iranian, and Greek the transition between Latin and Sanskrit." This theory was fatal to the old theory of successive separations and migrations from Central Asia. Penka combined Cuno's arguments with those of Schmidt; and contended that, as the primitive Aryans conquered and incorporated non-Aryan races, dialectic differences came into existence. For instance the peculiarities shared by Slavonian and Lithuanian might be due to the intrusion of the Finnish tribes; and the peculiarities between Slav and Iranian might be due to the incorporation of Ugrians. Differences in inflections, genders, cases, numbers, tenses, etc., must have arisen in consequence of racial conflicts and mixtures. An extreme phase of the development of these linguistic arguments is seem in the contention of Delbruck in 1880, that there was not only no primitive Aryan race, but there was no primitive Aryan speech as well; that the Aryans must have been divided even before a grammar was developed, and that this explains the differences between the languages of Europe. "*In short the primitive Aryan speech had begun to break up into dialects before it was fully formed.*"

The latest theory is that of Dr. Giles. In the *Cambridge History of India* he argues that the *Wiros* (which term he uses instead of *Aryan*) lived in the region covered by Austro-Hungary and Bohemia. From the close similarity of the Aryan languages he infers long residence in a severely limited area, divided from the wider world by great waters or mountains and provided with a temperate climate. He infers that they must have already known settled life and the domestication of animals (ox, cow, sheep, horse, dog, pig and deer). They must also, he points out, have known the goose and the duck, the eagle, wolf and bear but not the lion and tiger. Dr. Giles believes that Austria-Hungary provides the ideal country of agricultural plains and terraced pastures fit for breeding horses.

ARYANS IN MESOPOTAMIA AND EGYPT

The theory of the Aryan migration from Europe to Asia has been sought to be proved recently on various grounds. Aryan influence has been traced in the Semitic, Sumerian and Hittite names, words and cultures. A number of inscriptions have been discovered at Mitanni in Mesopotamia, which clearly prove that the Aryans were in Mesopotamia in the early centuries of the second millennium, and had no small influence on the cultural development of both Egypt and Mesopotamia. About 3750 B.C. Sargon I established the Sumerian-Arcadian empire and inaugurated that amalgamation of the Semitic and Sumerian culture which reaped glory during the next 20 centuries. About 2200 B.C. the Elamites from the East and the Amorites from the West pressed the Sumerio-Accadian empire between them. The latter of these[1] settled in the small up-river town of Babylon, which from this time onward became the celebrated capital of the Semitic-Sumerian-Elamite Empire. Under King Hammurabi, about 2100 B. C. the Babylonian Empire reached the extreme confines of Mesopotamia. In the centuries which followed Babylon's supremacy was challenged by both internal and external enemies. The internal enemy was the Semitic Assyria, and the chief external enemy were the Hittites from the West. It was in this age of mutual quarrels between Babylon and Assyria and the irruptions of the Hittites that the Aryans, who were distinguised from their contemporaries by the possession of the war chariot and the horse,[2] came into contact with the Babylon-Assyrian powers. An Aryan chief named Gandajb is credited with the conquest of Babylonia in this period and the establishment of a dynasty which lasted for six centuries. The Aryan dynasty of Babylon introduced the Aryan cult among the Accadian-Semites, and conquered the Elamites of Susa. From the Taurus mountains in the north of Mesopotamia to the shores of the Persian Gulf, the Aryan culture imposed itself thoroughly on the Semitic. In the decades which preceded and followed 1400 B.C. there seem to have been a series of matrimonial alliances between the Aryan kings of Mitanni and the contemporary Egyptian kings Thothmes IV, Amenhatap III, and Amenhatap IV; and thanks to the presence of the Aryan princesses in the harem, the last of these kings tried to establish a state religion inspired by Vedic idealism "in the place of the glorified totemism with its monstrous animal devas which had created the Egyptian pantheon."[1] It is thus absolutely clear that there was a close and interesting (though still obscure) contact between the Aryans and the Mesopotamians in the 2nd millennium B. C. Dr. Thomas believes (*J. R. A. S. 1916*, pp. 363-6) that the contact and conflict between the two civilizations should have taken place when the Indo-Aryan waves were pressing from Europe south of the Caspian on their way to ancient Persia and India."

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[1] The civilization of the Hittites, which has been studied in great detail of late, is interesting for two reasons. The Hittite inscriptions which are cuniform in structure, are Aryan,—according to some the earliest form of Aryan speech known. Hittite art bore a close resemblance to the Assyrian and the relative chronology of the two cultures has given rise to controversy. The Hittites have thus had a large influence on the Aryan as well as Assyrian civilizations and the exact relation which existed between them is bound to be of value in the elucidation of the origin and progress of the Aryan culture.

[2] That the horse was an Aryan introduction is accepted by all. A Babylonian seal represents a rider whip in hand and with a bird-like head in profile with no distinct hair or beard and mounted on an animal which is regarded by Mr. Leon Legram as the first representation of the horse in Babylonia; but others interpret the picture as that of a Bull and the Thunder-God Ramman. See *Nature*, Sept. 22, 1923, p. 455.

TILAK'S ARCTIC HOME THEORY

I have thus far dealt with the two great sets of theories in regard to the original home of the Aryans, namely, the Central Asian and European, and the routes by which they came to India. Attention should now be drawn to a third view which has been prominently before scholars ever since it was formulated, namely, that the Aryans had their original home on the banks of the Arctic Seas. Bal Gangadhara Tilak, the talented scholar who was the formulator of this theory traces with wealth of erudition the existence of different chronological layers and calendrical devices in the Vedic and post-Vedic literature and deduces from them the migration from an Arctic home towards India. He finds in the Vedic references to days and nights lasting for six months clues to the original Arctic abode. He deduces several astronomical phenomena of the Vedas to the Arctic environment. It is not possible to go into the details of his arguments; but that his views have had acceptance from even orthodox scholars is clear from the views of men like Brahma Sri Kavyakanta Ganapati Sastri.[2] He argues in favour of the original Aryan home in the North Pole. "There are very many references in the *darsans* of Maharishis to varying and continuous Ushas (dawn), a phenomenon corresponding to what the astronomers would call *perpetual day*--one coming behind the other in succession, each succeeding dawn brigther than its predecessor and the last of them being praised as being the brightest and ushuring forth the sun for which act of gratefulness the last of the dawns is praised highly and painted in glorious colours. The movements of the constellations of the polar regions are vividly described. There are there references to three distinct concentric orbits with the Pole Star as the centre. The Pole Star is the Mahameru, whereas Meru is the Pole Star near which, or from a small distance from which, the Aryans lived. The first of these circles is the orbit of the Saptarshis (the Great Bear); the second is the path of the stars from *Sravana* to *Visakha*; and the third the path of the stars *Anuradha* to *Uttarashadha*, all appearing to the inhabitants to be going round their heads. The sun had his distinctive spiral move, in each of which he shone over them for a distinctly longer time each time, either growing in lustre or getting dimmer as he was either rising or setting. He has five distinctive stages of rising and distinctive names. When half in the rising stage, he is called *Savita*. Later, before he is fully visible, he is *Bhaga*. Then he is *Surya* when his form above is clearly visible. The next is *Pushan* when his first rays begin to extend. When the sun has fully expanded his rays he is *Vishnu*. Each stage is clearly described and the sun is described journeying for a long time in each aspect distinctively. All these go to show that such phenomena are possible only in the polar region and not elsewhere". Ganapati Sastri sees traces of the Aryan progress southward in the Rig Veda itself. In Hiranyastupa's seeking mercy in the hands of Agni for not being able to worship the sun properly and in the hands of Indra for protection against plunderers and foes he sees evidences of the migration. The second Vedic period, he continues is the period when they were in close relations, sometimes friendly and sometimes inimical, with the Parsis of Central Asia. The third Vedic period began when they entered India, roughly corresponding to the Yadur-vedic period."

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[1] Havell's *Aryan Rule in India.*

[2] These views which were expressed in the course of a lecture at Tiruvannamalai a few years ago and which were published in the *Hindu* deserve to be given a more permanent form than an article in a daily newspaper.

In the expression *Meroh-dakshine-parsve* which figures in the *sankalpas* of the orthodox ceremonials performed by every Brahman and in the principle of the *Chaturmasya* when Vishnu is supposed to sleep and consequently no auspicious things can be done, which came into existence as the result of the perpetual night during this period, he sees corroborative proofs of existing and surviving traditions of the old Arctic home.

ARYAN PROGRESS IN INDIA

Such are the theories attributing a foreign origin to the Aryans of India.. And it is believed that their history in India is nothing else than the conquest and aryanisation of the Dravidians as a result of which there was an Aryo-Dravidian cultural synthesis. The theory was formulated at a time when the archæological remains in Sindh, Punjab, etc. were not discovered. But this fact does not seem to have altered the foreign theory in its broader aspects. It has only introduced other topics for discussion. What was the relation between the intruding Aryans and the 'Indo-Sumerians'? How were they disposed towards each other? Were they connected with each other by blood? Did they belong to the same race after all? Or were they different? If different, what was the exact nature of their intercourse? Again, what was the relation between the Sindhu men and the Dravidians or Mundas! Were they identical as some hold or were they different in race? If different in race how did their mutual dealings affect the Aryans?

ARYANS AND SUMERIANS

One view is that the authors of the Mesopotamian and Sindhu civilizations were not only identical but identical with the Aryans. In his *Indo-Sumerian seals*[1] *Deciphered* Col. Waddell argues that the Sumerians of Mesopotamia were Aryans; that they spoke an Aryan tongue (as is indicated by the Sumerian origin of many basic words in Sanskrit); that the Sindhu civilization was due to the settlement of the Phenicians or Sumerian Aryans as seafaring traders and colonists; that they introduced their families and priests, social structure, folklore, religion, etc. into India as a result of such settlements; and the Aryans of India could thus be ethnically and linguistically connected with the Phenicians, Sumerians and Britons. Waddell would interpret Semitic *Akkad* as the Sumerian Ariki or land of the Aryas. He would identify the Kshattriyas with the Hittites and the Vedic Indra with the Sumerian deity of *duru* or sea-water. Waddell studies the Harappa seals and their script and sees in them reproductions of Sumerian names and symbols. It is enough to state that these views of Waddell are not endorsed by any prominent scholar. They are regarded as speculative, inconsistent and far-fetched. It is quite possible to turn the evidences of Waddell to prove exactly the contrary, namely the derivation of the Sumerian civilization from the Aryan or Indian. To the same category should be assigned the wild speculations of Mr. R. S. Vaidyanatha Aiyar[1] who in his treatise called 'The Sumerion Origin of the Laws of Manu' and in various newspaper articles has tried to trace everything Indian to Sumerian influence without any basis of chronology or sequence or historic environment. His linguistic speculations tracing Sanskrit and Tamil to Sumerian origins are equally speculative.

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[1] A supplement to his "*The Phenician Origin of the Britons, Scots and Anglo-Saxons*" (1925) Phenician=Panchala. Hittite=Kshatriya. The Vedas refer to Asia minor, Syria and Phenicia as the Aryan home.

Another view is that the Aryans were not identical with the Sindhu men but their enemies. According to this the people of the Mesopotamian valley were Asuras, the reputed enemies of the Aryans. Dr. Banerjee Sastri (see *Journal of the Bihar and Orissa Research Society* for February 1927) holds that the Asuras, the elders of the

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[1] Besides his treatise on the Sumerian origin of the laws of Manu this writer has contributed various articles to newspapers on the same or similar topic. See e. g. *the Hindu* for April 13 of 1927 wherein he maintains the Sumerian origin of the Sanskrit and Dravidian languages. The Aryans and Sumerians lived together. They had the same legends, worship and language. The Sumerian or early Aryan language was the parent of all Indo-European languages.

Suras, were a sea-bred race who came to the Indus mouth from beyond the sea and settled there; that as children of the ocean they were regarded as universal sovereigns; that they were later on attacked by the Aryans (Devas); that the war lasted for 32000 years during which the Asura Naga emitted poison in vain; that the Asuras therefore once again fell back into the regions of their origin, that is, retraced their steps by the seas; that those who remained disappeared as separate entity in the new Arya-Asura-dasa body politic of India; that the Asura instinct induced the mixed race to expand southward and eastward as far as Ceylon and beyond the seas. Dr. Banerjee in short assigns the non-Aryan colours of some of the Vedic kings and Rishis to the fact that they were originally Asuras. The presence of non-Aryan affinities in the later Hindu religion, the careers of sages like Agastya, Vasishtha and Visvamitra; the synthesis of the Gods which led to the development of the doctrine of *avatara*, etc., are all evidences of the Asura-Arya fusion. This fusion, he continues, was completed in the mid-Himalayan Madhyadesa, the region of *dharma-kshetra-Kurukshetra.* The epics and puranas, he contends, deal disguisedly with the Asura-Aryan conflict and synthesis in legends like the churning of the ocean, etc.

Various other views are current to the similar effect. It is not necessary to refer to them in detail as all of them are based on similar commentaries on particular names and legends. The dangerous character of such attempts is evident in the fact that these are the very bases on which the advocates of the indigenous theory of the Aryans base their views. The Asuras, for example, are identified by them not with the Sindhu men but with some Kolarian tribes and the Dasyus with the Dravidians or pre-Dravidians.

THE INDIGENOUS THEORY OF ARYAN ORIGIN

The criticism against the foreign theory has gained force of late. A growing number of scholars maintain, on the authority of the traditional literature of India, that the

Aryans never came from outside India, but were indigenous to the land from the very beginning. They maintain that if any significance can be attached to Sanskrit literary traditions, it is this. On the contrary it was the Indian Aryas that sent colonies and offshoots beyond India to countries where they are now found in the west. Further, if Sanskrit was the chief representative of the old Aryan tongue, it is but natural and logical to suppose that the people who use it to the largest extent must be credited as the original branches of the race. It is, they say, preposterous to say that the speakers of Sanskrit, the most copious and and original of the Aryan tongues, were immigrants into the land where they perfected it while those amongst whom scholars assert its birth to have taken place have not cultivated it to any extent. How then are the few Aryan words found in the non-Indian Aryan languages to be explained? The answer is: they where carried from India by emigrants. The so-called Aryan invasion, thus, they maintain, is a myth.

Mr. P. T. Srinivasa Aiyangar asserts that the Aryans were the autochthons of the land between the Ganges and the Jumna, the celebrated Madhyadesa of Sankrit literature. He further believes that the so called Dravidians belonged to the same nationality; that the quarrels between them and Vedic Aryans were due to a religious difference; that the Aryas were the adherents of the fire-cult, while the Dravidians were the worshippers of the deities according to the Agama system; that the Aryas were a sacrificial people in consequence of their fire-cult while the others were enemies of *yagas* and satisfied the Gods by milder offerings; and that the division into Aryas and Dravidians was thus a domestic affair peculiar to Indian local conditions. He further believes that the fire-cult of the Aryas was introduced into the original Arya land, the Madhyadesa, by Pururava, the oldest king and the founder of the lunar race and the first sacrificer according to the Aryan methods. The exact area from which the fire-cult and the rites connected with it were thus brought, according to exoteric puranic geography was Ilavrata on the other side of the Himalayas. Thus " it is in the trans-Himalayan lands that we have to trace the germs of Aryan culture.[1]

Another doughty champion of the indigenous theory is Prof. Sundara Rama Aiyar[2] whose researches on Indian religion, philosophy and culture have been familiar to the intelligent public of the Madras Presidency for the last one generation and more. He contends that the Bharatas, after whom the country is named, were never outside India ; that the terms Aryan and Dasyu do not mean racial divergence but a cultural one ; that, if we are to believe the *Aitareya Brahmana*, most of the Ḍasyus were sprung from the Aryan sage Visvamitra ; that there is not the slightest ground for believing that the Dasyus (who also were Bharatas) ever resided in India at a time more ancient than that of the Aryas ; and that neither were immigrants from abroad. The Dasyus were only religious antagonists to the Aryans. There was no racial cleavage or strife. They were obnoxious to the 'Aryans' because they did not practise Vedic religion or talk the *girvana bhasha* (Sanskrit). The theory of separate Aryan invasion and conquest of Dravidians is a string of suppositions from top to bottom. The non-Aryan names and Vedic texts do not indicate a foreign origin. Pauranic authorities (*e. g.*, the *Harivasma*, *Vishnu-Purana*, *Matsyapurana*, etc.) deduce the Persian Yavanas from the Indian Turvasu and the Greek Mlechchhas from his son Anu. The *Harivamsa* describes the Sakas, Pahlavas, Kambojas and others as the rebel subjects of kings Raghu and Sagara and further maintains that the latter consigned them to separate *dharmas*, observances and duties which made them Sudras incapable of performing Vedic rituals. Thus the Persians, Greeks and others are only degenerate Indians or their emigrants ! The recent discoveries in Mesopotamia, maintains Prof. Sundara Rama Aiyar, prove such an expansion from India to the outside world. The deduction of Varuna from the Persian Ahura Mazda on the ground of his being called Asura is illogical as other deities also are called by that name. The fight between the Aryans and Dasyus was a purely local and spiritual fight between Vedic sacrificers and *karma-hinas*, if we are to believe Sayana and other traditional interpreters, and not a struggle between invaders and indigenous people. The theory of gradual Aryan expansion from the Punjab throughout Hindustan on the evidence of different strata of Sanskrit Vedic literature is unsustainable as all the Vedic branches should be regarded as a synthetic whole and as no chronological layers of a definite character can be assigned to them. The so-colled changed outlook alleged to have come into existence in the age of the *Brahmanas* in regard to sacrifice is a myth. The Vedic Aryas were uniformly sacrificers throughout their history, as Haug proves from the example of the *nivids* (half-poetical and half-prose hymns forming the most remotely antique parts of the Vedas). Philologically also the Dravidian languages were ancient, as the Dravidian races were indigenous. All the theories which attribute a foreign origin to the 'Dravidians' are speculative as those assigned to the 'Aryans.' Both are *Bharatas* though different in their religious cults and their spoken tongues.

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[1] The very divisions of the Hindu period, which Mr. P. T. Srinivasa Aiyangar gives, give a clue to the trend of his thought. These are the Palaeolithic age ; the Neolithic age ; Iron age ; pre-Aryan age ; the age of the Rishis ; the solar and the lunar dynasties ; the age of the later Rishis ; the age of Agamic greatness ; the Maurya and Gupta periods. See his Tamil 'History of India,' *Svadesamitran Press*, Madras.

[2] A series of articles in the *Hindu Message* of Trichinopoly in criticism of *the Cambridge History of India*.

ITS PLAUSIBILITY

From this detailed study of the various theories in regard to the origin and history of the Aryans in India, it is clear that the student is assailed by a hopeless chaos of conflicting creeds and cults among scholars. There is, on the whole, general tendency among the western writers to connect the Indo-Aryan with the European and to trace at least a cultural distinction between the Aryan, Sindhu and Dravidian. There is on the contrary the tendency among the Indian writers to attribute an indigenous origin to all. It must be acknowledged that the latter are indifferent to the evidences of ethnology, anthropology and philology. They also seem to have a psuedo-patriotism which regards any foreign influence as a myth. They attach too much faith to the *Puranas* thus going to the other extreme from that of their opponents. On the whole we may conclude that the Aryans and Dravidians were the same ethnically as they were branches of the same Indo-Mediterranean race; that the former however were less pure owing to admixture with pre-Dravidians for three or four millenniums; that the latter were a purer race who first probably perfected the Vedic, sacrificial cult somewhere in the regions of the Hindu Kush —from Bactria to Kashmir and the Punjab—and probably spread from there to different parts of the world.

It should be remembered that, as a writer in the *Manchester Guardian*[1] points out, "recent discoveries in China of evidences of what seems to be a civilization of the type (as the Sindhu) and of approximately the same period point to the very interesting possibility of a great civilization extending along the whole of Central Asia from east to west . . . A number of scattered sites on the northern Baluchistan frontier and in the North-west Frontier Province which have been partly excavated by Sir Aurel Stein show evidences of the same civilization having extended to those regions, which are now regarded as among the most inhospitable and inaccessible in the world." Further the Gangetic basin still remains unexplored and it has been suggested by Sir John Marshall that the future might show that the Sindhu culture was after all Indian. If the latter were ever proved, we shall have to conclude that the civilization of the Aryans spread from India along the plateau of Central Asia across to Mesopotamia to Europe. There is nothing inherently impossible in the Sumerian and Phenician adoption of the Aryan cult of Indra, as Prof. S. V. Visvanatha[2] points out in his *Racial synthesis in Hindu Culture*, Introduction p. 15) Mr. Visvanatha uses the very weapons of Waddell against him. He sees the Kshatriyas in the Hittites and the Brahmans in the Sumerian Baramas. He sees Parasurama popularised in Sumer as Bur-sin. He sees in the Rigvedic Ruma a reference to 'Rum'; in Kripa the land of the Phenicians; in Syavaka the Slavs and so on. In the presence of the deities Indra, Varuna Mitra and Nasatya in the Boghaz-keui inscription he finds a corroborative proof. References there are in the Rig Veda to Indra's migration to the west. The split between the Indian and Persian Iranians would more probably have taken place in India than elsewhere. Manu's son *Nabhanadishtha* was the origin of the Avestic *nabhanadishta*. The cuniform tablets at Tel-et Amarna show that kings possessing Indian names were tributary to the Pharaohs. The names of the Mitanni kings were Indian. The Kassite records of Babylon show the same. The Accadian prayers to the sun and fire are echoes of Vedic prayers. Marka the Asura Guru becomes an evil God among the Accads. The migrations of culture, religion and customs, moreover, was in those days generally from the east to the west. The Italian archæologist Boni sees in the *Forum* of Rome a site of Vedic funeral practice, indicating that the Latins were Aryans who reached Europe from North India through Persia and Asia minor. All these would indicate in Prof. Visvanatha's opinion the Aryan cradle to be in the Himalayan region roughly extending from the valley of the seven rivers to the source of the Ganges and Jumna. He infers from a passage in the Rig-Veda that Agni worship was prevalent in the 4th millennium B. C. and Indra worship in the next and that it was in the latter period that the Aryan culture spread to the west.

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[1] Reproduced in the 'Indian Daily Mail' of 12th Novr. 1927.

[2] Prof. S. V. Venkatesvara Aiyar of the Mysore University is of the same opinion in his first volume of *Indian Culture through the ages.*

THE BACTRIA-KASHMIR HYPOTHESIS

The array of evidences on behalf of the indigenous theory is indeed formidable. Their greatest defect seems to me to be in the linguistic field, It is not easy to see how if the Aryans and Dravidians were autochthons of the same land Sanskrit would have arisen. The rise of this language so entirely different from Dravidian and so closely allied to the Indo-Germanic seems to me to indicate that the Aryans must be assigned not to the Madhyadesa but to the north-west,—to the region stretching from Bactria to the Punjab. The probability of the Kashmir-Bactrian-Punjab hypothesis is, in my opinion, not less strong than that of the European. All the arguments of original temperate-zone-home for the Aryans can be applied to this area. Further traditions refer to the trans-Himalayan source of the fire-cult. We may thus conclude that about B. C. 3000 a section of the Mediterranean dolicocephals who occupied the region of Bactria-Kashmir-Himalayan[1] uplands, the lands of the archaic Vedic and Paisachi dialects, developed a sacrificial cult and during the next millennium gradually spread themselves across the Western Asiatic plateau, influenced the Babylonian and Egyptian civilizations and penetrating the European plain through the Caspian, Black sea and Balkan regions, laid the foundations of Aryan Europe. This change might well have taken place during the 3rd millennium. It can adequately explain how the most advanced of the Aryan tongues has existed in Sanskrit and how it has influenced the Asiatic and European cultures and languages. It can also sufficiently explain the remarkable perfection showed by Vedic language and literature. It should never be forgotten that such a well-developed language could not have been an exotic one. The Dasyus and Asuras mentioned in the Vedas may be the men of the Indus civilization with whom the 'Aryas' naturally came into hostile contact. The Mundas and other aboriginal peoples were probably the Nishadas and Dasyus, the Rakshasas and Pisachas of Sanskrit Vedic literature. The formation of Zend in Persia was perhaps slightly later than the Rig-Vedic age and subsequent to the Aryan expansion westward from the Kashmir region and the formation of an Aryan State in Persia or rather Irania.

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[1] It is probable that Herat, the Areia or Ariyana of old, was the centre of this region, as Mcgrindle points out. Sir George Birdwood (See J.R.A.S. 1909, p. 593) says that the ancient Iranians had the name Hindu for a river and called the region about Herat the region of the seven rivers. The Indo-Aryans called the Punjab later on Saptasindhu. Sir George thinks that the term *Hodu* in Esther I and VIII is India.

The struggle between the Aryans and the Sindhu men on the one hand and the Dravidian Kols on the other led to a synthesis of culture to which a clue is available in the Vedic literature itself. The term Asura is used both in good and bad sense, giving a clue to the different stages of enmity and compromise. The prevalence of cremation as a rule (though not invariably) in Sindh remains seems to indicate the adoption of an Aryan custom. The rectangular aisles again have been surmised to be adopted from the Vedic altars. Similarly the humped bull, the antelope, the brick flooring, the abundance of gold ornaments as compared with silver ones, the dolico-cephaly of the skulls (except for stray brachy-cephaly), the prominent nose of even the brachy-cephalic Sindhu man, etc. seem to indicate the Aryan influence on Sindhu. On the contrary the Aryans took over several elements from the pre-Aryans. These questions however will be discussed in another volume and not the present.

THE DATE OF THE BEGINNING OF ARYAN CULTURE

There has been the widest possible controversy in regard to the date of the commencement of the Vedic age which, according to most scholars, was synoymous with the Aryan immigration into India. For a long time it was held that the composition of the Rig-Veda should be placed between 1500 and 1000 B. C. Prof. Max Muller, for example, held that opinion.[1] Then Kaegi the translator of the Rig-Veda, enunciated the theory of 2000-1500 B. C. and Prof. Haug, the translator of the *Aitareya Brahmana*, that of 2400—1400 B. C. Later on Prof. Max Muller himself came to believe in this comparatively earlier date. "Within sight of the Indus and its tributaries," he says, "the undivided south-east Aryans spoke a language more primitive than Sanskrit or Zend, about 2000 B. C." Then came a period when scholars out-max-mullered Max-Muller and said that he was more correct in his earlier views than the latter and that the Rig-Veda should be brought down to one or two centuries before 1000 B. C.

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[1] See his *Sanskrit Literature*, 1859.

MAX MULLER'S THEORY

Now in order to understand the reason why these scholars favoured this late date it is necessary to go through the arguments of Max Muller in 1859. He first of all took as the basic fact of his speculations the invasion of Alexander and before it, the rise of Buddhism. Now, Buddhism pre-supposed the entire sacred literature of the Brahmanical civilization—the *Mantras*, *Brahmanas*, *Aranyakas* and *Upanishads* he concluded that the whole of the literature was pre-Buddhistic, that is before 500. B.C. Max Muller next supposed that the Vedanta and Sutra literature was contemporaneous with the origin and spread of Buddhism, and *arbitrarily* placed it between 600 and 200 B.C. If the Sutra works belonged to this period—Max Muller confessedly fixed it on an arbitrary basis—the *Brahmanas* and *Upanishads* which immediately preceded them might, he suggested, have occupied a space of two centuries, *i.e.* 800 to 600 B.C. The *Brahmanas* pre-supposed the Vedic Samhitas and allowing another two centuries for their *collection* Max Muller concluded that their *collection* might be assigned to 1,000 B. C. Following the same line of argument the great scholar attributed—on an even more professedly speculative basis—another two centuries for the composition and currency of the hymns. In short, he concluded that the Vedic invasion and colonisation of the Punjab must have been about 1,200 B. C. *at the latest*. Max Muller, in 1890, was[1] careful enough to warn students that his intervals of 200 years were purely arbitrary, that it was only the *terminus ad quem*, that it was impossible to fix the earliest date ; that " *whether the vedic hymns were composed in 1000, or 1500,* or *2000, or 3000 years B.C. no power on earth could ever fix.*" This extremely important caution, however, was ignored as Winternitz points out[1], by most writers; and though there were occasionally savants[2] who carried the earliest vedic chronology to 1500 or even 2000 B.G. the vast majority took the suppositions of Max Muller as proved facts, and held that the date 1200—1000 B.C. for the Rig-Veda was quite proved.

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[1] Gifford Lectures, 1890.

THE VIEWS OF JACOBI AND TILAK

In 1893 two scholars came forward with revolutionary views on the subject. These were Prof. Jacobi of the Bonn University and Bal Gangadhara Tilak of Poona. The researches of these were, though synchronous, entirely independent and prove how two powerful intellects came to the same conclusion on independent lines. Both of them took for the data of discussion the astronomical[3] conjunctions and events given in the different parts of the Vedic literature. We know that the Vedic sacrificers had to depend on the position of the moon in the 27 constellations for the fixation of their rites and ceremonials. There are many passages therefore which mention the *Nakshatras* in conjunction with the full or new moon. Now the astronomical investigations of the Vedic ages which were originally confined to the movement of the moon came subsequently to take into account the solar movement also. It is well known that it takes more than 12 lunar months for the sun to come back to the same constellation in its course. Therefore one solar siderial year came to be equated to 12 lunar months (with some additional days), and the 12 months were named after the constellations in which the moon is full. Another change was that the sacrificial rites were made not only in the purely lunar dates of new and full moon but at the commencement and in the course of the solar year. As Haug says, the Satras lasted for one year and were but an imitation of the sun's annual course. They were divided into two distinct parts, each consisting of six months of 30 days each, with a *Vishuva* or equinoxial and central day dividing it into two halves. Now there were various attempts to frame a calendar for sacrifical purposes based on the lunar and solar systems as well. It was as the result of such attempts that, as the *Brâhmanas* state at one place, the year was made to commence with the sun in the vernal equinox and the moon in the constellation of Pleiades *(Krittika).* Now we know that the tropical year of the sun is not the same as the siderial year. Owing to the difference between the two, there is a precession of the Equinox from one star to the next after a space of 2000 years. The Vedic seers were ignorant of this necessary change of the equinoxial day from one star to the previous one at the expiration of two millenniums. But they *saw* that the sun had changed its position and the seasons also undergone variation. They therefore had to change their calendar in accordance with this changed position from time to time. Now both Jacobi and Tilak contend that the Vedic literature contains passages which give a clue to these different adjustments of the calendar and therefore, to the exact position of the sun and the solar events of the solstices and equinoxes. Now, as it is easy to calculate the date at which the sun stood at a particular star on the equinoxial day by simply allowing the space of 2,000 years from one star to another, these scholars have been able to fix the dates of the Vedic Aryas.

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[1] See *The Age of the Veda*, translated into English in the *Deccan College Quarterly*, Vol. XXVI, Nos. 2 & 3 for December 1918, and issued as a separate pamphlet at Poona by N. B. Utgikar. The translation is from Winternitz's *Geschichtader indischen Litteratur*, Pt. I, 2nd Edn. Leipzig, 1909; pp. 246-58.

[2] E.g. L. Von. Schroeder in *Indien's Liter Und Kultur*.

[3] Ludwjg had about 1885 tried to do the same on the basis of solar eclipses.

Prof. Jacobi's arguments are briefly these. We have already seen how the *Brahmanas* state at one place that the year commenced with the sun in the vernal equinox and the moon in the constellation of the *Krittikas.* Other Vedic texts indicate that the same vernal equinox took place when the moon was in the constellation of Orion, that is *Mrigasirsha* and not Krittika. The extent of this precession, points out Jacobi, indicates the range from 4500 to 2500 B.C.; and he therefore concludes that the Vedic civilization should be assigned to this period. The beginnings of it got to the middle of the 4th millennium B.C. and the *Brahmana* portions to the middle of the 2nd millennium.

One additional and corroborative argument which Prof. Jacobi gives is that the *Grihyasutras* mention the *Dhruva* or the Pole Star in connection with the marriage ceremonial of the Aryans, a custom which exists to the present day. The age was therefore aware of a Pole Star which was long-standing enough to be regarded as immovable. "Now one result of the precession of the equinoxes," says Winternitz, "is that with the gradual change of the heavenly equator the North Pole also moves forward, and in the course of 26000 years, it circumscribes a circle of the radius of 23½ degrees round the fixed pole of the ecliptic. Therefore one star after the other slowly moves near the North Pole and becomes the Northern or the Pole Star; however it is only rarely that a very bright star approaches so very near the Pole that for all practical purposes it can be regarded as a fast-standing (*Dhruva*) one. At present the star Alpha in the Small Bears is the Pole Star in the northern hemisphere. This star could not naturally have been meant by the Pole Star spoken of in the Vedic times, since even before 2000 years, it was too far away from the Pole to be regarded as *Dhruva*. There is to be had, however, another Pole Star to whom this name could be well applied at 2780 B. C. At this latter time, Alpha Draconis stood for over 500 years so near the Pole that it must have appeared motionless to an observation by the naked eye. We must therefore ascribe the origin of the name *Dhruva* as also the rise of the custom showing the fixed star to the bride as the symbol of fixity on the nuptial evening, to the first half of the 3rd millennium B.C. In the marriage hymns of the Rig-Veda, there is however no mention of this custom; and therefore Jacobi regards it as probable that "the employment of Dhruva in the nuptial ceremony belongs not to the time of the Rig-Veda but to the following period, and that, therefore, the epoch of Rig-Vedic civilization lies before 3000 B.C."

The contentions of Bal Gangadhar Tilak first published in the *Orion* in 1893, are based on the same data but entirely different methods. Tilak traces, with a wealth of erudition, the existence of different chronological layers and calendrical versions in the Vedic as well as post-Vedic literature, and deduces from them the chronological evolution of the Vedas. It is advisable for understanding the subject to trace the different layers retrospectively, and begin, for this purpose, from the time of Varahamihira in the 5th century A. D. According to this astronomer the vernal equinox (*Meshasankramana*) coincided with the end of *Revati* (as in the present day) and the summer solstice (*kataka sankramana*) was therefore in *Punarvasu*. This system prevails even to-day. The year begins with the vernal equinox in the end of *Revati*, the summer solstice is in *Punarvasu*, the autumnal equinox (*tulasankrama*) is in *Chitra* and winter solstice (Meshasankramana) in *Puradha*.

An earlier layer mentioned by Varahamihira himself is that of the *Vedanga-jyotisha*. Here we are told that the year did not begin with the *Mesha-sankaramana* or vernal equinox but with *Makara-sankranti* or winter solstice in *Dhanishta* instead or Puradha. It follows that the vernal equinox (Meshasankramana) was in the last quarter of Bharani or in the beginning of the Krittika (instead of Revati as at present), the summer solstice (Katakasankramana) in *Aslesha* (instead of *Punar-vasu*) and the autumnal equinox (Tulasankramana) in *Visakha* (instead of *Chitra*) The first year of the cycle, in other words, began with the sun and moon together at the beginning of Dhanishta and the Uttarayana also began at that time. Now, when could the sun have been at the end of Bharani during its equinoxial position ? Tilak points out, on the well-known allowance for the precession, that it should have been between 1269 and 1181 B. C. From this he concludes that the Vedanga-Jyotisha should be attributed to that period.

Then we have a still earlier period referred to in the Taittiriya-Samhita. Here the *Krittikas* are mentioned as the first of the Nakshatras and the constellation of the vernal equinox. But the beginning of the year is not here but in the winter solstice with the sun in Sravishta—a fact which led to the modern significance of the terms Dakshinayana and Uttarayana. The yearly *Sattra* began with the winter solstice and the *Vishuva* was simply a central day. The Krittika however continued to be the beginning of the nakshatra sacrifices. Now, when did the sun occupy *Krittika* during the vernal equinoxial day? Tilak points about: about B. C. 2350. Prof. Whitney allowed all these premises but believed that the Krittikas referred to the beginning of the zodiacal house to which it belonged and so put it back by II degrees and therefore the date II x 72 or 792 years, that is, 1426 B. C. later. But Tilak argues that the asterisms in the early Vedic Age were not zodiacal, but merely fixed constellations and that Whitney, like other scholars, demurred to arrive at the logical conclusion of their premises on account of their prejudice regarding Indian antiquity.

Λ still earlier layer is that of the Rig-Veda which says that the *Vishuva* or equinoxial day was the central day which divided the *Sattra* or sacrificial year into two halves and which thus indicate that the year commenced on the vernal equinox. The real meaning of *Uttarayana*, points out Tilak, was not the period of the sun's course from Makaram to Katakam as it is held at present, but the period of the sun's stay north of the equator from the vernal to the autumnal equinox. "The fact that the central day of the annual Sattra was called *vishuva*, the vasanta or spring was considered to be the first of the seasons, and that the *Agrahayaneshti*, or half-yearly sacrifices were required to be performed every Vasanta (spring) and Sharad (autumn) clearly show," concludes Tilak, that Devayana or Uttarayana in those days must be understood to have extended over the six months of the year, which comprised the three seasons of spring, summer and rains, *i.e.*, from the vernal to the autumn equinox, when the sun was in the northern hemisphere or to the north of the equator. "We can now understand why vasanta had been spoken of at the first season, and the Nakshattras have been divided into two groups called the Deva-nakshattras and the Yama-nakshattras In the absence of anything to the contrary we might therefore take it as established that in the early Vedic days the year began when the sun was in the vernal equinox; and as the sun then passed form the south to the north of the equator it was also the commencement of his northern passage. In other words the *Uttarayana* (if such a word was then used), *vasanta*, the year and the *Satras*, all commenced together at the vernal equinox, The autumnal equinox which cames after the rains was the central day of the year; and the latter half of the year was named the *Pitriyana* or what we should now call the *Dakshinayana*."

Tilak next points out that in the time of the Vedic Samhitas, Margasiras was at the vernal equinox and there was Chitra-phalguni full-moon at winter solstice which commeneed the year in the month of Megha. It was the existence of the full moon in the Phalguni and *Chitra* constallation in the first month of Magha that made the Satapatha-Brahmana call chitraphalguni full moon the first night of the year. It is thus clear, says Tilak, that there was an older year in the early vedic age beginning with the *Phalguni* full moon in Magha, "There is *apriori* no impossibility involved in the hypothesis that the old priests, after changing their starting point to the Krittikas and framing the calendar accordingly, continued to recognize for sacrificial purposes the older position of the Nakshattras, just as all Brahmans from the Himalayas to the Cape Comorin at present perform their sacrifices on days and at times fixed when the vernal equinox was in the Krittikas." The year in the older Vedic age then began with the Phalguni full moon and the winter solstice occurred on that day, the vernal equinox therefore falling in the asterism of Margasiras. As proofs of the fact that Margasiras was the first of the Nakshattras Tilak adduces the use of the term Agrahayani in connection with it, the application of the Mula to the asterism at the corresponding autumnal equinox, the fixation of the pitriyana or the ayana of the manes in the first fortnight of Bhadrapada which would then be the commencement of the corresponding summer solstice, a fact prevalent among the Parsis also This Orion period, he points out, must have been between 4000 and 2500 B.C. And it was during the last few centuries of this age, he further points out, that the separation of the Hindu Aryans from the Persian Aryans took place as a result of which the Aryans came into India. It only remains to be added that the Aditi or pre-Orion period when the Aryans were, according to Tilak, on their Arctic home must be assigned to from 6,000 to 4,000 B.C.

The conclusions of Tilak have been accepted by scholars like Haraprasada Sastri. He places the Vedic civilization between 4,500 and 2,500 B.C. during the earlier part of which the Vedic hymns were *composed* and in the later *compiled*. Buhler (*Ind. Antq.* 1894) argues in favour of this early date on political grounds. He points out that the existence of definite Vedic schools like those of Bodhayana and Apastamba in the south shows that, inasmuch as immediately after the conquest, the Brahmanical colonisation could not have been so great as to give rise to distinct schools, the Aryan advent to the south must have taken place centuries before,—perhaps in the 7th and 8th century B. C. Buhler's contention is that this Aryanisation of the south in the 7th century B. C. at the latest is incompatible with the alleged existence of the Aryans in the Punjab and East Afghanistan about 1500-1200 B. C. "The presumption that the Indo-Aryan people of the Vedic times, with their many divisions into tribes and with their internal perpetual dissensions, conquered the 123,000 square miles of India proper (excluding the Punjab, Assam and Burma) within five, six or even eight centuries, founded cities and organized themselves after one and the same pattern, appears simply ridiculous; and it appears all the more so when it is remembered that this province was inhabited not by wild tribes, but to a great extent by peoples who did not possess any much lesser degree of civilization than the conquerors."

KEITH AND MACDONELL

The more rigid and conservative scholars like Whitney, Thebaut, Macdonell, Keith and Oldenberg refused to give up their views. Whitney and Thebaut argued that the equinoxes had nothing to do with the Vedic conceptions of time. Keith[1] endorses them and regards all conjecture regarding Vedic date on that basis as 'useless.' Macdonell regards Jacobi's theory as 'invalidated by the assumption of a doubtful, and even improbable meaning in a Vedic word, which forms the very starting-point of the theory.' Philologically he is even against the date of B. C. 2000, as the starting point. "Supposing this to be correct," he says, "the truly vast period of 1500 years is required to account for a development of language and thought hardly greater than that between the Homeric and Attic age of Greece. Prof. Max Mullers's earlier estimate of 1200 B.C. formed 40 years ago," concluded Prof. Macdonell, [2] "appears to be much nearer the mark. A lapse of three centuries, say from 1300-1000 B.C. would amply account for the difference between what is oldest and latest in Vedic hymn poetry. Considering that the affinity of the oldest form of the Avestan language with the dialect of the Vedas is already so great that, by the the mere application of the phonetic laws, whole Avestan stanzas may be translated word for word into vedic so as to produce verses correct not only in form but in poetic spirit; considering further that, if we know the Avestan language at so early a state as the Vedic, the former would necessarily be as almost identical with the latter, it is impossible to avoid the conclusion that the Indian branch must have separated from the Iranian only a very short time before the beginning of Vedic literature, and can therefore have hardly entered the North west of India even as early as 1500 B.C." Similarly Greswold, the Editor of the Rig Veda, would place the dispersion of the Aryans between 3000 and 2000 B. C. their coming into India about 1500 B.C., the compilation of the earlier Vedic hymns to between 1200 and 1000 B. C. and the later hymns to 1000-800 B.C. Further, he would assign the *Brahmanas* to 800-600 B.C. and the *Samhita* text of the Rig-Veda to 600 B.C. Oldenberg attacked the arguments of Buhler and maintained, on the analogy of the progress of civilization in America, that the space of seven or eight centuries is ample enough for the spread of Aryan civilization to the south and that it is not necessary to go further back than 1200 B.C. It is unnecessary to load these pages with further references. It is enough to say that the net result of the views of this school is that the Vedic literature from the original *mantra* to the *samhita* stage belongs to the period ranging from 1200 to 600 B.C. Some would go up to 1500 B.C., but do not differ in other respects.

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[1] See J.R.A.S. for 1917, p. 135. Keith, while acknowledging that so far no cogent evidence has been brought to show precisely why the first place for ritualistic purposes should be assigned to *Krittikas*, "holds that the question can be solved only when real evidence on the origin of the Nakshatras is known, and that the "Babylonian hypothesis of their origin still remains the most plausible." See also *Indian Historical quarterly* Vol I. pp. 4—17.

[2] Sanskrit Literatnre, p. 12.

THE VIEWS OF WINTERNITZ

Dr. Winternitz,[1] on the contrary, has taken the more liberal view. After criticising Oldenberg's analogy between American and Indian examples, he argues thus: " As regards the political conditions in India, we learn from some of the hymns of the Reg-Veda and from the epics tnat what has been proved with regard to the later history of India took place also in its older and the oldest times, *viz.*, continuous warfare of the Aryan tribes among themselves. Under such circumstances the conquest of India could proceed only step by step and extremely slowly. If we compare with each other the two oldest layers of the literature of India, we can easily as a matter of fact see that the advance of the Aryans towards the east and the south proceeded only with extreme slowness. We find in the hymns of the Rig-Veda the Indo-Aryan people living exclusively in the extreme northwest of India and in Eastern Afghanistan. And then the period in which rose the hymns of the Rig-Veda must have extended over centuries. This is attested to by the many different strata of older and later constituent parts, which we meet with in these hymns of the Rig-Veda. The circumstance that the Rishis, who are suppositiously designated as the 'seers' or authors of the hymns, are regarded not only in the *Anukramanis* but even in the *Brahmanas* as 'seers' of very great antiquity, points in the same direction. And the authors of the hymns very constantly speak of 'olden' songs or 'songs' composed after the old fashion, as though these songs were composed some immemorial time ago. After pointing out that the Rig-Veda lies at the root of all other Vedic works, Winternitz continues: "The religious points of view and the social circumstances are all entirely different. The *Brahmanas*, *Aranyakas* and the *Upanishads* pre-suppose not only the hymns of the *Rig-Veda*, but also the works and the prayers of the other *Samhitas*, all as extremely old and sanctified texts. Indeed these ancient hymns and texts were perhaps no longer understood. The old legends had fallēn into oblivion. I might only draw attention to the difference that divides the Sunakshepa legend in the *Aitareya Brahmana* and the same as given in the hymns of the *Rig-Veda*. The oral tradition too pre-supposes quite a long period of time before these texts came to be written down. Generations of pupils and preceptors must have preceded before all the existing and the many now entirely lost texts would have assumed a definite shape in the Vedic schools. On linguistic, literary and historical considerations, we must, therefore, assume that between the time of the oldest hymns and the final unification of the hymns into a Samhita, since the *Rig-veda* shows only the conclusion of a long preceding period and further between the Rig-Veda Samhita and the Brahmanas, many centuries must have gone by. Now the Brahmanas themselves with their numerous schools and sub-schools, with their un-ending lists of teachers and their plentiful allusion to teachers of antiquity, require a period of many centuries for their growth. This literature—and going hand in hand along with this, the spread of Brahmanical culture and theological knowledge and, not the least of all, the priestly domain—must have required centuries. And when we come to the Upanishads we find that they too belong to different periods, and that they also postulate generations of teachers and a line of tradition. And we have to remember that, during this whole time which has continued from the first beginnings of the Vedic literature to its latest developments, the Indo-Aryan people have conquered only a relatively small stretch of land, *viz.*, from the Indus to the Ganges. If indeed this advance from the extreme north-west to the land of the Ganges in the east claims so long a period of time, for how many centuries must have continued the conquest of the whole of the Central and Southern India! When we remember this, 700 years would not appear to us any longer too large a period." Some additional arguments are given by Winternitz to the above. He points out that the Buddhistic literature pre-supposes not only the *Vedas* but the *Vedangas*; that Brahmanical literature and science had already reached a high development; that the Buddhists called their dogmatic text *sutras* even though they were not written in the *sutra* style; that the better knowledge of the historical evolution of Bhagavatism, Jainism and other creeds shows that the compression of these within seven centuries is not correct; that there are reasons to believe that Jainism and Bhagavatism, not to speak of other possible cults, were clearly pre-Buddhistic.

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[1] Z. D. M. G. Vol. 49, p. 479.

On all these grounds Winternitz would not assign a definite date for the beginning of the Vedic civilization. He would simply say that it lasted from X to B.C. 500, preferably B.C. 800, taking X to be at least third millennium B.C. if not the fourth. He does not definitely adopt some of the astronomical arguments given by Tilak and Jacobi, because he sees in the Vedic reference to the seasons, the beginning of the year, etc. 'utmost confusion'. He also draws attention to the serious doubt expressed regarding the Vedic attention to the equinoxes. On the other hand, he regards Jacobi's argument in respect of the Pole Star as not disproved. On all these grounds he would, while waiting for further investigations into Indian astronomy to confirm Jacobi, have no hesitation, in the light of the internal history of India as sketched above, to take the beginnings of the Vedic culture to the third millennium B.C. at least, while avoiding giving any definite figures.

The arguments on behalf of the view taken by Dr. Winternitz and Haraprasada Sastri have received the most welcome corroboration in the recent discoveries at Harappa and Mohenjo-daro. These indicate that in the 4th and 3rd millenniums B.C. the Sindhu valley was full of a rich, thriving and highly civilized population. There is absolutely no doubt that the Vedic Aryans were the contemporaries of the Sindhu people and progressed in India at their expense and at the expense of the Dravidians, pre-Dravidians and Kolarians.

INDIA IN THE BEGINNING OF THE VEDIC AGE

The condition of India at the time when the Aryans emerge into history can be briefly described. The whole of the Indus valley was occupied by the highly civilized "Indo-Sumerians" whom we may call the *Sindhians*. To the north of their land were rising the Aryans in the same bronze or copper age of culture but probably more virile, organized and disciplined. They met the Sindhians, the Asuras of the Vedas. The Aryans vanquished not only the Sindhians but the Kols and Dravidians who were called Dasyus, Rakshasas and so on. The struggle ended in the victory of the Aryans; but wise conciliation on their part led to the synthetic civilization of the later Vedas, Brahmanas and Upanishads. The skulls discovered at Nal, Sialkot and Byana seem to disclose an even racial synthesis in the centuries which followed. In South India the Dravidians who had subdued the pre-Dravidians and driven them to the mountains were not so much aryanised. They were still in the neolithic age or just emerging into the iron age. The question of the discovery and use of iron and its influence on the growth of civilization belongs to the early times of 'historic' India, as compared with 'pre-historic' India. The definition of the relations of the Aryans towards the Sindhians, the Dravidians, the pre-Dravidians and the Kolarians was the chief problem in the history of India in the new age inaugurated by the advent of the Vedic Aryans. That theme in all its multifarious aspects, political, social, religious, intellectual, linguistic, artistic, *etc.*, forms the fascinating subject of the next volume.

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